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DISEASES OF THE CHEST

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Editorial Comment

PACIFIC COAST STATES ISSUE

IN conformity with a policy which was started at the inception of this journal, one issue of *Diseases of the Chest,* is devoted each year, to the presentation of a picture of sanatorium facilities, of the advances made in tuberculosis control in one state or in a group of states in this country.

In 1935, the August issue of *Diseases of the Chest,* was dedicated to the State of New Mexico. In 1936, the May issue of *Diseases of the Chest,* was dedicated to the State of Missouri. In 1937, the June issue of *Diseases of the Chest,* was dedicated to the States of North Carolina, South Carolina, Virginia, Georgia, and Florida; and it was known as the *South Atlantic States Issue.*

This year, it is our privilege and pleasure to dedicate this issue of *Diseases of the Chest,* to the States of California, Oregon, and Washington; and the issue is to be known as the *Pacific Coast States Issue.*

Each of the states represented in this issue of the journal has contributed two or more scientific papers, dealing with subjects related to chest diseases, and written by physicians who are closely identified with the treatment of chest diseases in those states.

Each of these states has presented a picture through the printed word and by illustration, showing the present facilities for the treatment of the tuberculous within those states.

This issue of the Journal also carries the pictures and the biographies of physicians in the States of California, Oregon, and Washington; who have pioneered in tuberculosis work in their respective states. We pay tribute to these pioneers of medicine, and only regret that we do not have the space available to include the biographies of many more of the eminent physicians who have been pioneers in this great cause.

It is the purpose of the Editorial Board of *Diseases of the Chest,* to eventually compile similar issues for each of the forty eight states and the District of Columbia; either through the publishing of the data from single states or in groups of states, as was done in this instance. With the publication of this issue, ten of the forty eight states will have been completed.

The Editorial Board of *Diseases of the Chest,* expresses its appreciation to the State Committees under whose direction this issue of *Diseases of the Chest* was compiled, and also to the officials of sanatoria, tuberculosis societies, and to all of the other individuals and agencies that cooperated to make this issue of *Diseases of the Chest* possible.

—F. W. B.

EDWARD WILLIAM HAYES, M.D.

— PRESIDENT —

AMERICAN COLLEGE
of
CHEST PHYSICIANS

DR. EDWARD WILLIAM HAYES was born July 4, 1883 at Millville, Minnesota where he spent his early years. He received his academic training at Carleton College, Northfield, Minnesota and his medical education at the University of Minnesota Medical School where he graduated in 1913. For the next few years he practiced general medicine in Minnesota until he broke down with tuberculosis in 1918 and was forced to give up his practice temporarily. He entered the Trudeau Sanatorium at Saranac Lake, New York. Here he became interested in tuberculosis as a specialty and, after taking work in that line at the Trudeau School, he went to Arizona where he remained two years, devoting his practice to diseases of the chest. Since 1922 he has been located at Monrovia, California.

Dr. Hayes has been a leader in the medical developments in the handling of tuberculosis and has taken an active part in the study and improvement of methods of its prevention, diagnosis and treatment. He has written rather extensively on the various phases of the tuberculosis problem, particularly with reference to the treatment of this disease.

At the present time, Dr. Hayes is a member of the staff of the Los Angeles County General Hospital in the department of Diseases of the Chest, he is associate professor of medicine in this same department in the College of Medical Evangelists of Los Angeles and he is Chief of the Department of Diseases of the Chest in the Orange County and the San Bernardino County Hospitals. He is engaged in private practice in Monrovia where he is Medical Director of the Maryknoll Sanatorium, an institution of about fifty beds, owned and operated by the Maryknoll Sisters. He has been a Fellow of the American College of Physicians since 1927 and in June, 1937, he became president of the American College of Chest Physicians.

WELCOME TO CALIFORNIA

"OPEN UP THOSE GOLDEN GATES
CALIFORNIA, HERE WE COME!"

AMERICAN COLLEGE OF CHEST PHYSICIANS

MEETS AT THE ST. FRANCIS HOTEL

San Francisco, California

SUNDAY, JUNE 12, 1938

Program will be mailed upon request.

VOL. IV. JUNE, 1938 No. 6

DISEASES OF THE CHEST

PACIFIC COAST STATES ISSUE
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CALIFORNIA SECTION

EDITORIAL COMMITTEE:

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FOREWORD:

TUBERCULOSIS has always constituted an important Public Health problem in California. When the migration of white men to California began, this state's tuberculosis problem appeared, and it has been present continuously for almost a century. During the last few decades, the prevalence and mortality from this disease has been greatly reduced, but the death rate from tuberculosis in California is still, today, higher than that of most other states.

The Anti-tuberculosis League was organized in California in May, 1902, with Dr. F. M. Pottenger, Sr. as president, several years before the National Tuberculosis Association was started, and has grown to be the largest and most important unofficial public health organization in the state. It was mainly through the efforts of Mrs. Edythe Tate Thompson, then secretary of this organization, that the tuberculosis subsidy bill was passed in 1915. This law has served as the impetus for the development of the system of state subsidized county sanatoria which now serve nearly all of California. More than twenty such sanatoria receive substantial subsidies, totaling millions of dollars annually, from the state under this policy, and in return the State Bureau of Tuberculosis insists on their maintaining a high standard of care for the patients.

In the pages of this section will be presented only a few statements regarding some of these institutions and the work they do.

Lack of space and insufficient funds have prevented the editors from publishing pictures and histories of all of the sanatoria in California. It is our hope that the many tuberculosis workers visiting California this year may find opportunity to become better acquainted with our activities, and that by mutual exchange of experience we may both profit.

WELCOME TO THE WEST

The sage advice "Go West, Young Man," followed by so many seekers for fortune and adventure in the early years, and later by the no less ernest seekers after health, may well be followed this year by those interested in learning about tuberculosis, since this year for the first time in history the American Medical Association, the National Tuberculosis Association, the American Sanatorium Association, the American College of Chest Physicians, and other organizations engaged in the battle with the White Plague are all meeting within the same state of California in well timed succession

It is hoped that this little journal may help to introduce our visitors to the resources available for this campaign in the Pacific Coast. May the meetings here be pleasant and profitable and the time outside of the business sessions give a glimpse of the natural advantages and hospitality of the West.

PIONEERS IN TUBERCULOSIS WHO ARE STILL CARRYING ON

JOHN C. KING, M.D.
1853 —

DR. JOHN C. KING was born at Pittsburgh, Pennsylvania, on February 9th, 1853. After ten years of medical practice in the East he contracted tuberculosis. Given a year to live, he came to Banning, California, in September, 1883, bringing a friend with him who promised to take care of the burial details.

He bought the Banning general store and took this friend in as a partner. He was postmaster for two years and the first local fire insurance agent.

Dr. King performed capital operations on kitchen tables: emergency operations on the bare ground, far from water; and amputations in box cars, by lantern light, with train crews assisting.

Dr. King was President of the San Bernardino County Medical Association, and later of the Riverside County Association. He was President of the Southern California Association and also of the State Association. He was a member of the Board of Medical Examiners for several years and became its President. Today, a memorial library is dedicated to him, housed in the Riverside Public Library.

He founded the Banning Hospital and Sanatorium for the tuberculous which still carries on his work under the direction of Dr. A. L. Bramkamp, his former associate. He distributed circulars all over the United States advertising Banning's claims as a health resort and thus contributed largely to the development of the community.

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CHARLES CLIFTON BROWNING, M.D.
1861 —

CHARLES CLIFTON BROWNING was born in Denver, Illinois, May 25th, 1861. As a small boy he lived through the trying days of the reconstruction in a section where there was much division of opinion and sympathy. He received his degree from the University of Missouri in 1883, and returned to his home to take up practice. In 1885 he married Helen Tillapaugh of Denver, Illinois. He later went to New York and was on the Staff of the City Asylum for the Insane from 1888 to 1891. Developing tuberculosis, he moved to California in the latter year. After a rest of some months he resumed his practice and for several years carried on in the face of active lesions, which must have been at times of the florid type. He finally became interested in tuberculin therapy and attributed his arrestment to this agency. Probably this was the basis for his continued belief in its therapeutic value, though he was always conservative in his adminstration of it.

Ever since his recovery he has been active in tuberculosis work. He was one of the leaders of the public education when that was first started in this state, and was a very active member of the Tuberculosis Commission which made a study and report to the State Legislature in 1913. In 1914 he was elected president of the California Tuberculosis Association, and served for four terms. He has also been president of the Los Angeles Tuberculosis Association and the Los Angeles County Medical Association. For many years he served as director of the National Tu-

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PIONEERS IN TUBERCULOSIS WHO ARE STILL CARRYING ON

FRANCIS MARION POTTENGER, M.D.
1869 —

DR. FRANCIS MARION POTTENGER was born on a farm near New Baltimore, Ohio, September 27, 1869. He attended the public schools at New Baltimore, Ohio; graduated at Otterbein College, Westerville, Ohio, with degree of Ph.B. in 1892, receiving degrees of Ph.M. 1897, A.M. 1905, LL.D. (honorary) in 1909. He graduated at Cincinnati College of Medicine and Surgery in 1894, and took post-graduate medical courses in New York in 1900; European clinics (Vienna, Berlin, Munich, London) in 1894, 1905, 1907 and 1909. He began the practice of medicine in Norwood, Ohio, in September, 1895.

Teaching positions held: Assistant to the Chair of Surgery, Cincinnati College of Medicine and Surgery, 1894-95. Professor of Clinical Medicine, Diseases of the Chest, University of Southern California, 1903-4; 1905-1909; 1914-1920, and from 1931 to the present date.

In 1902 he was instrumental in establishing the Southern California Anti-Tuberculosis League, the ninth organization for the prevention of tuberculosis in the United States, which was established two years before the National Tuberculosis Association. He was its first President and served until 1906. The Southern California Anti-Tuberculosis League was eventually merged into the California Tuberculosis Association, of which he was President in 1931-32, and has served on the Board of Directors since 1930.

He established the Pottenger Sanatorium at Monrovia, California, in 1903, of which institution he is the medical director.

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ROBERT A. PEERS, M.D.
1875 —

DR. ROBERT A. PEERS was born in Woodstock, Ontario, of hardy English stock on December 13, 1875. After receiving his primary schooling in the grammar schools of Woodstock, he entered the Woodstock Collegiate Institute, leaving after a period to matriculate at Albert College, Belleville. Dr. Peers received his C.M. and M.D. from Trinity University, Toronto, in 1899 and was made a Fellow of the Trinity Medical College in the same year (F.T.M.C.).

After receiving his degree young Peers immediately commenced practice in Colfax, California. Here he observed that chronic chest cases were constantly being attracted by the favorable climate. Recognising that these patients deserved the care of a competent specialist, he began the intensive study of tuberculosis and since 1909 has devoted himself exclusively to the care of patients suffering from this disease. As the result of natural advantages and skilful medical care, the reputation of Colfax as a health resort spread rapidly until Dr. Peers was Medical Director of one of the largest, privately owned, tuberculosis sanatoriums in the country.

Chief among Peers characteristics have been his warm, personal friendship toward the patients and the attitude he has chosen, embodying the attributes of physician and teacher to almost equal extent. From time to time young physicians, who have broken down with tuberculosis and who have sojourned at the Colfax School for the Tuberculous, have been listed among its graduates and have gone to various

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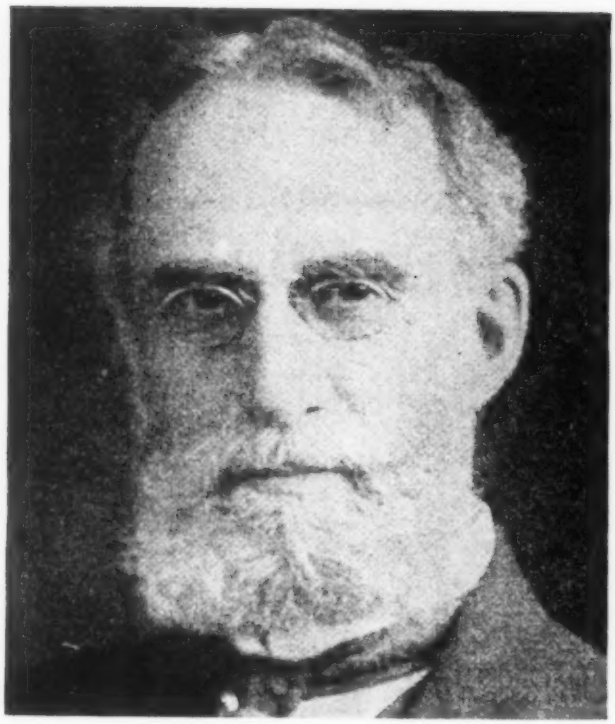
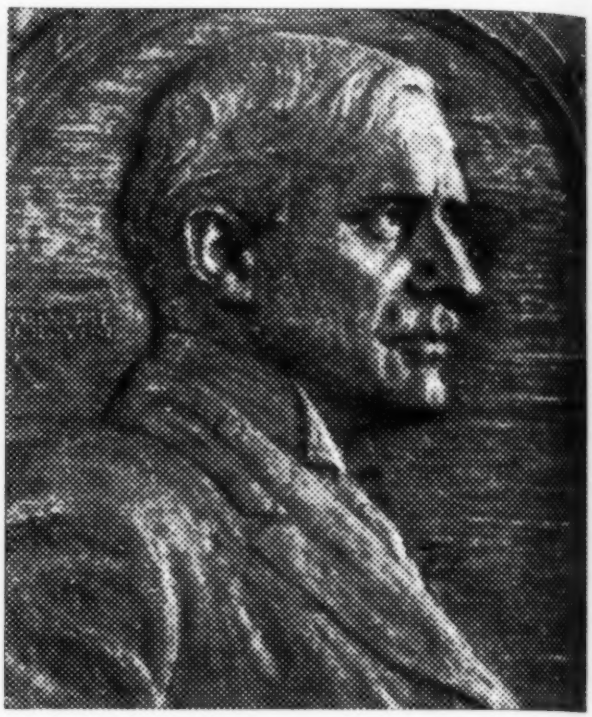
PIONEERS IN TUBERCULOSIS WHOM WE COMMEMORATE



NORMAN BRIDGE, M.D.
1844 - 1925

NORMAN BRIDGE was born in Vermont in 1844. Dr. Bridge received his general education in country schools and in the High School of DeKalb, Illinois. He then taught in a country school for a time. He began the study of medicine in 1865, attending the Medical Department of the University of Michigan and later graduated at the Northwestern University in 1868 with the degree of M.D. From the time of his graduation he began to teach medicine and for more than 30 years his name appeared on the faculty of some medical college, first in his Alma Mater, then in the Womens' Medical College and after 1874 at Rush Medical College.

His health broke down and while searching with his own microscope he found the tubercle bacillus in his sputum and gave up his work and came to Sierra Madre in Los Angeles in 1890. Later he opened an office in Los Angeles. Increasing interest in the oil business, in which he made quite a fortune, caused Dr. Bridge to give up his active practice, but he retained considerable interest in professional affairs. He published four books, one of which contained his lectures on tuberculosis. His autobiography "The Marching Years" describes his oil activities in which he made several million dollars which was later left, in great part, to public institutions, including several tuberculosis sanatoria. —E. B.



HENRY B. STEHMAN, M.D.
1852 - 1918

"*ONE of the Noblest of Men, a Great Physician, A Great American and a Great Christian.*"

—These are the words on the memory tablet on the walls of the new and beautiful *La Vina Sanatorium* originally founded by Dr. Stehman.

Dr. Henry B. Stehman was born in Pennsylvania in 1852: Graduated from Lebanon Valley College; studied for several years in Leipzig and Brussels; on his return entered Jefferson Medical College from which he graduated in 1877. His interneship was at Blockley. After practicing medicine several years in Lancaster, Pennsylvania, he was called in 1884 to the Presbyterian Hospital of Chicago as Superintendent. The Presbyterian Hospital expanded rapidly under his executorship, but too much of his health went into that growth. Breaking down, Dr. Stehman came to California in search of health, opening an office in the city of Pasadena, while convalescing. He soon realized the great need for a rest home for the tuberculous and interested many friends and citizens of Pasadena who contributed toward the purchase of 240 acres in the beautiful foothills of Pasadena. Other friends contributed individual cottages and *La Vina* was founded as a semi-endowed non-profit institution and formally opened in 1909. Many patients have received treatment and Dr. Stehman continued his noble work until the year of his death in 1918. —W. A. H.

PIONEERS IN TUBERCULOSIS WHOM WE COMMEMORATE

WALTER JARVIS BARLOW, M.D.
1868 - 1937

WALTER JARVIS BARLOW, M.D., came to California in 1895, suffering from pulmonary tuberculosis. He began the practice of medicine in Los Angeles two years later. He restricted his practice to Internal Medicine and naturally showed an early interest in diseases of the chest. In 1904 he founded the Barlow Sanatorium which has gradually grown to an institution of 100 beds. Admission has been restricted to those of moderate means, residents of Los Angeles County or natives of the State of California. From its inception the Barlow Sanatorium has been maintained as a semi-charitable institution with minimal charges which cover but a small percentage of the patients' care. The remainder of the cost has been met by private donations or bequests, which have almost all been acquired through Dr. Barlow's personal efforts.

Dr. Barlow also founded the first medical library in Los Angeles, which was known as the Barlow Medical Library until 1934, when the publications were all transferred to the Los Angeles County Medical Association. The work has since been carried on by the County Association with these books and periodicals forming the nucleus for further expansion.

From 1908 to 1914 Dr. Barlow was Dean of the Los Angeles Medical Department of the University of California, where he occupied the chair of medicine for many years.

With these philanthropic and educational activities, Dr. Barlow possessed a large private and consulting practice, which, however, did not pre-

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MAX ROTHSCHILD, M.D.
1871 - 1936

DR. ROTHSCHILD was born July 10th, 1871, at Hoffgeismar, Germany, and educated at the Universities of Kiel, Heidelberg and Berlin, being graduated by the Board of Examiners of the University of Berlin in 1896. After a year of post-graduate study at Berlin in tuberculosis he came to San Francisco, arriving in 1899, to practice medicine.

In San Francisco he met Dr. Fehleisen, the discoverer of the streptococcus of erysipelas, whom he had known in Europe—and together they had many enjoyable rambles about San Francisco, as Dr. Rothschild delighted in telling. Their bear hunting experiences in the Ingleside District of San Francisco will always remain classics.

After several years of general practice he devoted himself exclusively to the treatment of tuberculosis and pulmonary conditions. In association with Dr. Harry C. Warren he opened the California Sanatorium at Belmont in July, 1919, which has developed into one of the largest institutions for the treatment of tuberculosis in the West.

Professionally he was always alert to new ideas, being the first clinician in America to induce artificial pneumothorax for pulmonary compression. He and Dr. Fehleisen obtained the first reports of Forlanini's work in Italy and constructed a pneumothorax apparatus. He was also one of the first advocates of phrenic nerve interruption and a pioneer in the use of tuberculin. He early discovered that dosage was the important factor in treatment and if controlled to avoid reactions,

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PIONEERS IN TUBERCULOSIS WHOM WE COMMEMORATE

WILLIAM H. BUCHER, M.D.
1874 - 1934

WILLIAM HENRY BUCHER was born in Sunbury, Pennsylvania, January 1, 1874, and graduated from the Medico-Chirurgical College in Philadelphia in 1896. As surgeon in the United States Navy he devoted more than a dozen years to establishing the finest kind of friendly relations with the people he encountered all over the world. Volcanoes, earthquakes, floods, famines, plagues and pestilence were all met by a sympathetic understanding and quiet effectiveness that endeared him to those with whom he came in contact.

Pulmonary tuberculosis compelled him to retire from the Navy and regain his health in Colorado and Arizona. A growing private practice was then interrupted for further naval service as Lieutenant Commander of the Naval Hospital at San Diego and then for an adventurous experience as Medical Director of the Central Division of the American Red Cross Mission in Siberia. The last fifteen years of his life were given to building up at Olive View California the sanatorium for indigent consumptives of Los Angeles County, as its superintendent.

Dr. Bucher was not a prolific writer nor a frequent speaker. A deep thinker, who weighed his words and ideas carefully, his chief contributions are to be found in the work he accomplished and in the effect of his example on those about him. Many of his experiences and reflections, taken from his diary and from contributions to the sanatorium paper and other writings, were published, posthumously, in the book

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MUNFORD SMITH, M.D.
1891 - 1937

DR. MUNFORD SMITH, born December 2, 1891, in Pittsburgh, Pennsylvania, graduated from the University of Maryland Medical School, and later made his home in Los Angeles. In 1920 he became Assistant Resident Physician at the Barlow Sanatorium and was continuously connected with the Sanatorium from that time until his death, occupying the position of Medical Director for ten years.

Dr. Smith was an usually able clinician with a wide experience in diseases of the chest, possessing rare judgment in the various methods of treatment for patients suffering from pulmonary tuberculosis. He was also frequently called upon for expert opinion in medico-legal problems by insurance companies and before the California Industrial Commission. In this last connection he was a recognized authority on the results of inhalation of dust and noxious gasses.

He has written many papers on the effects of silica and other dusts in relation to compensation for disability. These papers have been widely published.

He was a member of the Los Angeles County Medical Association, a fellow of the American Medical Association, and a fellow of the American College of Physicians. He was a member of the Board of Directors of the National Tuberculosis Association, and it was while completing his term as President of the American Sanatorium Association that his career was cut short by death June 28, 1937. —H. W. B.

Pneumoconiosis, Non-Siliceous

J. J. SINGER, M.D., F.A.C.P.

Los Angeles, California

FROM the wealth of material published during the last few years on pneumoconiosis, one is impressed with the preponderance of evidence that silicosis is the one kind of involvement which produces clinical symptoms and definite roentgenological changes in the lungs.

It is true, however, that the other forms of pneumoconiosis such as anthracosis, siderosis, and asbestosis, and those due to organic dust such as cotton, jute, and hemp contribute their share of patients with respiratory diseases.

The medical-legal aspect of pneumoconiosis is of such importance to the physician, industrial worker, and to business in general that a great deal of experimental work was done to see if remedies for pneumoconiosis could be developed. Thus far none have been found except the prevention of dusty atmospheres for workers.

The pathological condition found in the lungs varies with the amount of *dust inhaled per unit of time;* secondly, with the *chemical* and *physical property* of the dust inhaled; and thirdly, the *individual himself.*

The changes in the lungs, when pneumoconiosis develops, are usually fibrosis in greater or lesser extent, there is bilateral involvement. It begins with small nodules of gray fibrous tissue—the tracheo-bronchial lymph nodes are usually pigmented and at times are calcified around the periphery. The nodules may become larger with time. In non-siliceous dust disease we may find some fibrosis of the parenchyma but little or no nodulations. The more acute non-tuberculous pulmonary diseases appear to be more prominent in such cases. Thus the high pneumonia rates of Pittsburgh have been ascribed in part to the smoke.

The association of non-silicotic anthracosis, especially, with primary cancer of the lung, has been stressed, and Schneeberg lung cancer is apparently also associated with another type of pneumoconiosis. Recently laboratory workers have also suffered from inhalations of radium with permanent deposition in the tissues.

The distinction between silicosis, characterized by pulmonary fibrosis of an almost specific nature, and non-siliceous pneumoconiosis, characterized by accumulation of dust cells (phagocytes) especially in the regional lymphatics but eventually throughout the lung, without the consequent proliferative reaction, cannot be made too strongly; but the existence and clinical significance of the latter need not be entirely neglected.

The association of silicosis and non-siliceous pneumoconiosis as in anthracite coal anthraco-silicosis usually is manifested mainly by the silicotic phenomena, but may sometimes show the reverse emphasis. It is difficult to draw the distinction, even at autopsy, between anatomic silicosis or pneumoconiosis, without symptoms, and the clinical diseases, especially when complicated by later infections.

In individuals who work with cement, soft coal, shell dusts, or other dusts, there may be enough $Si\ O_2$ in the particular material with which they work that actual silicotic nodules develop.

Microscopically, dust particles are found in the alveoli with some detritus. If there was prolonged exposure one sees pigment-bearing phagocytes filled with carbon particles. Later these cells are found in the interalveolar lymph spaces and in the lymphatics of the interlobar septa—As the accumulation of pigment increases they form lines along the septa of the lobules and the vascular channels and finally small nodules appear at the points of junction of the various lymph channels.

The degree of involvement depends on the amount of silica present in the dust inhaled.

It is important to know that while the accepted view, until recently, was that the sharp edges of the silica particles injured the lung now it is considered that the danger of silica lies in the fact that when it becomes soluble it is a direct poison to the cells. (Gardner[1]).

Gye and Kettle[2] also state that their work showed that colloidal silica is a poison to cellular tissue.

Symptoms of pneumoconiosis of various types are all similar, only the degree varies. The most important symptom is dyspnoea on slight exertion, fever, night sweats, and slight hemoptysis.

Any dusty atmosphere may be the inciting cause of some respiratory infection. Some persons may have better pulmonary activity —muscular and ciliary, than others; also those who already have pharyngeal irritation or bronchial catarrh, if they are exposed to considerable dust may develop some pulmonary fibrosis.

Tuberculosis, which is well known as a common disease in the general population, could be present in workers before entering employment in non-siliceous dust establishments. It is not surprising that this disease is aggravated in such atmospheres. It is most important, in preventive medicine, that all workers be examined not only by a physical examination, but also by roentgen ray studies before they are permitted to work.

Cement workers, brick and tile workers, and also those in grain elevator industry, were studied in Canada[3] and while the average time of work in these industries was 13 years, no cases of silicosis were found.

The roentgen film in non-siliceous pneumoconiosis is not as diagnostic in a positive way as in the silicotic condition. It is quite evident why this should be so because the shadows produced on the film are due to fibrosis of more or less extent due to silica which involves the lymphatic system beginning at the hilum and extending outward and downward. When the involvement is extreme, large conglomerate shadows are found, usually in the mid portion of the lung fields.

As the non-siliceous dusts do not produce this fibrosis, except when silica is a part of the dust, the only signs are those of fine densities with no nodulations.

Porcelain workers are easily affected by respiratory diseases. When workers have been employed for many years, fine shadowy particles may appear in the film which are relatively soft and the borders are moderately sharp. These shadows are pin-head in size in both lungs and of equal intensity. The bronchial markings may be moderately thickened.

Those who work in clay are not so apt to show evidence of fibrosis, yet when large number of workers are studied, fine mottling in the lung fields may be noted. Clinically, few show signs of disease. It is only after ten to fifteen years of employment that any signs appear. As a general rule, therefore, one can assume that clay workers rarely develop pneumoconiosis.

Cement workers rarely develop any form of pneumoconiosis unless, as stated previously, silica is part of the material used. Lime dust is more or less soluble in the air passage and is easily eliminated.

The solution, however, if workers are employed for many years, may in time produce bronchitis which simulates pneumoconiosis—then linear densities may be present for many years and can easily be detected on the roentgen film.

In the report on silicosis in Germany at the Johannesburg International Conference[2], a significant statement is found, which is as follows: "The mortality rate for cement factory workers showed no difference from that for the local population at the same ages, but rather remained considerably under the average for the district; the tuberculosis mortality rate in particular was within ten years under the average for the whole Bavarian population."

When one is confronted with the problem of an interpretation of a roentgen film as to whether pneumoconiosis is present or not, the density and location, the sharpness of outlines of shadows must be considered. It has been found by statistical studies of thousands of films that occupational groups who have been exposed to substances rich in free silicic acid (sandstone, porcelain—quartz, etc.) show the most dense shadows, nodulations and sharpness of detail—while those groups who work with the non-siliceous dusts show only faint shadows, no nodulation and frequently no abnormal findings.

Asbestosis is a form of non-siliceous pneumoconiosis which has received a great deal of attention, especially in England. It is, of course, important to know the history of exposure to asbestos dust. According to Wood and Gloyne[4], the patients have an earthy complexion and a slight violet tinge in their cheeks and lips. The physical signs are not

noteworthy other than dry, fine rales in the bases. The roentgen film, however, shows a fine fibrosis affecting the lower lungs; it appears as if the lines are etched into the film. The exact diagnostic significance of asbestosis bodies in the sputum is doubtful because the dust particles may have been only in the larger bronchi. But if fibrosis is found in the bases, linear in outline, and there is a history of exposure and symptoms of dyspnoea, the diagnosis of asbestosis is warranted. It is suggested that the only treatment of this condition is in the early stages and then the only thing recommended is to discontinue this type of employment. When exposure has been prolonged the usual complications are septic bronchitis, bronchopneumonia and pulmonary tuberculosis.

The pneumoconiosis of the coal miners and those who develop so-called siderosis is important, because from the roentgen pictures alone one might be confused as to whether silicosis is present. Strange as it may seem, some of the most advanced cases of pneumoconiosis of this type have little or no dyspnoea and are able to work for years. If the silica content of the coal is high then of course silicosis may develop.

In the dusty atmospheres associated with cotton, jute, and similar products, the irritation produced in the respiratory tract is relatively mild except in certain individuals. The dust particles are too large to be inhaled deeply into the lungs, but tracheo-bronchitis is not uncommon.

Conclusions

1. Non-siliceous pneumoconiosis is often a debatable condition in particular workers.
2. Fibrosis in non-siliceous cases is mild compared to silicotic involvement.
3. Respiratory diseases, such as bronchitis, emphysema and even tuberculosis may be complicating factors in pneumoconiosis of non-siliceous type.

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Mucosal Tuberculosis of the Bronchi and Trachea

PAUL C. SAMSON, M.D., F.A.C.S.*
Oakland, California

ACCORDING to the best pathological evidence available, tuberculous tracheobronchitis is always secondary to pulmonary tuberculosis and is caused by contact with bacillary sputum. Mucosal tuberculosis was recognized by pathologists over 100 years ago, but prior to 1931 clinical case reports were extremely rare. We now know that tuberculous tracheobronchitis is relatively common. Recently, 272 sanatorium patients with adult pulmonary tuberculosis consented to bronchoscopy as part of the routine work-up on admission. Eleven per cent were found to have active or healed mucosal lesions.

The importance of recognizing these lesions clinically lies in the fact that often their presence materially alters the prognosis. The author is strongly convinced of this through his personal experience with more than 100 cases. In patients with advanced mucosal disease, complete control of the pulmonary tuberculosis is not necessarily sufficient, since well-established bronchial and tracheal lesions can be self propagating. We have repeatedly seen patients die as a direct result of extension of the mucosal tuberculosis even when the pulmonary tuberculosis was being adequately handled.

Mucosal disease may be suspected by the presence of untoward symptoms and by a careful study of serial roentgenograms of the chest.

The symptoms of most significance are: persistent oral wheeze and rhonchi; asthmatoid attacks; paroxysmal or intractable cough with difficult expectoration; dyspnea in spite of a good vital capacity; exceptionally tenacious sputum; feeling of lodgement of

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sputum; sputum persistently positive for acid-fast bacilli in spite of control of the pulmonary tuberculosis; unexpected fever, usually associated with sudden decreases in the amount of sputum.

Roentgenographically, various types of *atelectasis* are associated most frequently with mucosal disease. These consist of lobar and subtotal atelectasis either preceding or following collapse therapy, and intermittant atelectasis. A "tennis-ball" or "balloon" cavity (often containing air under positive pressure) usually results from the expiratory check-valve action of a partially obstructed lobar or tertiary bronchus. A similar mechanism may explain the failure of a cavity to collapse in spite of an apparently adequate pneumothorax. Rapidly changing cavities and the non-expansion of a lung after cessation of pneumothorax also may be due to mucosal disease with partial obstruction.

The correlation of symptoms with roentgenographic findings is of particular importance. In the routine bronchoscopic study referred to above over two-thirds of the group with mucosal lesions had both suspicious roentgenograms and clinical symptoms. Considered separately, suggestive roentgenograms are a more accurate index of the presence of disease than are symptoms.

The patient who presents any of the symptoms or roentgenographic changes enumerated above is entitled to a bronchoscopic examination. This is the final important step in diagnosis. Contrary to former general opinion, bronchoscopy is not contraindicated in cases of active pulmonary tuberculosis and no harm results if the examination is done skillfully. Bronchoscopy should not be performed in the presence of advanced laryngeal ulceration, tuberculous pneumonia or severe hemoptysis from an obvious cavity.

In the stem bronchus the most circumscribed lesions are nearly always unilateral and extrude from a lobar branch. The spread is usually upward into the trachea by direct extension. Bronchoscopically, several types of lesions may be recognized, more than one of which may be present in the same patient.

In the *submucosal* or *nonulcerative* type of infection there is localized congestion, edema and granularity of the mucosa. The area bleeds easily. Discrete yellowish submucosal tubercles or elevated tuberculomas may be seen.

A more severe form of infection is the *ulcerative* type. Obstructing masses of granulation tissue may or may not be present. These lesions can be self-propagating even in the absence of pulmonary activity. Experience has shown that collapse therapy often has no beneficial effect on ulcerative mucosal tuberculosis.

The healing of active mucosal lesions does occur and if the infection is originally circumferential in the bronchus or trachea, a *fibrostenosis* results. This may be localized. Occasionally, the patent bronchial lumen may be greatly obstructed by a tortuous scar-tissue tunnel, one or more centimeters in length. When the healing process is only partial, an *ulcerofibrostenotic* lesion may persist over a long period of time and successful treatment is very difficult.

The bronchoscopic differential diagnosis involves consideration of non-specific bronchitis, neoplasm, syphilis, rhinoscleroma, erosion from lymphatic glands, various forms of compression stenosis, and asthma. The bronchoscopist should be aided by familiarity with the history, roentgenographic and laboratory findings. We feel that biopsy of suspected tuberculous mucosal lesions is dangerous. Serious extensions of the pulmonary tuberculosis have followed this procedure. If, however, some means of cautery for the biopsy area is immediately available, the forceps removal of obstructing tissue may be warranted. If the evidence suggests that the visualized lesion is not tuberculous, a biopsy should be procured.

The treatment of mucosal tuberculosis at present is not entirely satisfactory because of inadequate clinical experience. We do know that serious consideration should be given to bronchial and tracheal lesions. Local treatment may be essential prior to, or during pulmonary collapse.

In general, the submucosal type of infection will heal if the pulmonary tuberculosis is brought rapidly under control. This is not necessarily true of ulcerative lesions. The former symptomatic use of atropine, epinephrine, ammonium chloride and autogenous sputum vaccines now has been discarded as useless. Likewise, tuberculin therapy has not proven of value.

The best results today are being obtained

by local cautery of ulcers and granuloulcerative lesions, combined with collapse therapy for the pulmonary tuberculosis. The use of silver nitrate has been recommended, but the author's strong personal preference is for high-frequency electro-cauterization. Specially constructed insulated electrodes of small diameter are used through the bronchoscope. We feel that much greater accuracy of treatment can be obtained in this manner. The results have been gratifying to date. Three to five treatments are usually given at intervals of from two to four weeks. Obviously this method cannot be used if the lesions are inaccessible to the bronchoscope, i.e., ulceration distal to a stenosis.

Ultraviolet has proved disappointing in the attempted control of localized granuloulcerative lesions. Pathological studies have shown, however, that a diffuse microscopic tuberculous infection of the trachea and involved bronchus often accompanies the more localized gross disease. Ultraviolet therapy may, therefore, be of great benefit as an adjunct to local cautery. This possibility is being further explored at the present time.

The use of roentgen radiation should be mentioned. At times, patients are seen in whom both ulceration and stenosis are present. Local treatment is impossible because the active disease cannot be reached. In a series of these patients, the use of roentgen therapy in divided doses has caused regression of the active lesions. In several an increase in troublesome fibrostenosis has been observed. Acute mucosal tuberculosis should not be treated by roentgen therapy.

Bronchoscopic bouginage is the treatment of choice in pure fibrostenosis. Retained secretions are aspirated and the mucosa thoroughly shrunken with equal parts of 10 per cent cocaine and 5 per cent ephedrine. One to three dilatations may be all that are necessary and with an active collapse program for the pulmonary tuberculosis a cure may be expected. Occasionally, partial dilatation of an obstructed lobar bronchus can be accomplished by means of a curved vertebrated aspirator. In cases with a lengthy tortuous stenosis relief from obstructive symptoms may not be obtainable by dilatation, and thoracoplasty usually is futile, if not actually harmful. Lobectomy or pneumonectomy must be considered instead. Such lesions may be found unexpectedly and in several clinics bronchoscopy is now a routine procedure before thoracoplasty finally is decided upon. Fibrostenosis of the trachea is very serious and attempted dilatation with solid bougies has not been successful. Graduated sized bronchoscopes can be used with some success. Often one must commence with the 4 mm. instrument. Dilatations can be repeated in from ten to fourteen days, but no more than three bronchoscopes should be passed at one operation.

Summary

In summary, mucosal tuberculosis of the bronchi and trachea is a complication of active pulmonary tuberculosis which often may have serious consequences. Hence, its recognition is of importance. Clinically tuberculosis tracheobronchitis may be suspected by the correlation of suggestive symptoms and roentgenographic findings. With few exceptions, bronchoscopy should be used as the final step in diagnosis and as a guide to therapy. To date, the writer has obtained his best results by the use of high frequency electro-cautery. Special electrodes have been designed to be used through the bronchoscope. Finally, lobectomy, pneumonectomy or external drainage of a tuberculous cavity occasionally must be considered in dealing with the secondary effects of high grade bronchial obstruction.

ANNOUNCEMENT

Dr. Max Pinner has been appointed chief of the Division of Pulmonary Diseases in Montefiore Hospital, New York, and will assume his duties on September 1.

Dr. J. Burns Amberson, Jr., has been appointed a member of the consulting staff of this division.

Pneumoperitoneum in the Treatment of Pulmonary Tuberculosis

HAROLD GUYON TRIMBLE, M.D., F.A.C.P.
Oakland, California

A progress report on the use of pneumoperitoneum in the treatment of pulmonary tuberculosis is in order. Reviewing briefly the results of its use in our hands, as published in the "American Review of Tuberculosis," July, 1937, and the report by Banyai in "Diseases of the Chest," January, 1938, together with the verbal reports given to me personally by various colleagues (who have by now had sufficient experience with enough cases to warrant an opinion in evaluating the use of this procedure) all confirm our previous opinion that it has a definite place in the treatment of pulmonary tuberculosis. Again, it would seem that while there are many theoretical indications for its use, there are two important ones. First, extensive bilateral pulmonary tuberculosis where the vital capacity is so limited and toxicity so great that no other type of collapse seems warranted, particularly artificial pneumothorax or temporary phrenic interruption. Certainly no more extensive collapse procedure in this type of patient could be considered, and one that is simple and reversible has great appeal; and second, to reinforce and make more effective the unilateral collapse obtained by any type of operation on the phrenic nerve.

A few case reports to illustrate this follow:

(1) *D. S.*, age 24, white, single, American-born Italian girl. Occupation, stenographer.

Six years ago noted lumbar back aches, particularly when changing position. These gradually increased, but continued work for 9 months. Four physicians were seen without relief. An elastic girdle was prescribed, and worn for a year with no benefit. In 1934 began to cough. Six months later cough became productive and has remained so since. February, 1936, deformity of the spine was noted in the lower dorsal region. X-ray films taken showed extensive destruction of two lower dorsal vertebrae characteristic of tuberculosis. She was put to bed by her attending physician; the back pain became less severe, cough and sputum diminished. No chest X-rays were taken. In November, 1936, glands on both sides of the neck were noted to be enlarged. This enlargement gradually subsided.

When first seen by us in March, 1937, she presented a picture of dyspnoea, emaciation, extreme toxicity. Temperature averaged 101°F daily. Chest x-rays showed an old fibrotic pulmonary tuberculosis with multiple cavities throughout the left, and a recent spread, with a large cavity in the upper portion of the right lung. The spine had shown no change.

Marked secondary anaemia promptly responded to the use of iron by mouth. May 10, 1937 artificial pneumothorax was attempted, and very small space obtained, low and laterally. This was ineffective and could not be maintained. May 24, 1937 pneumoperitoneum was initiated; refills of 1000 cc. at weekly intervals were given, and are being continued to date. Temperature normal within 3 months. Marked gain in weight. Sputum reduced to 20 cc.; positive for tubercle bacilli. X-rays show marked resolution of previous exudative lesions, and the cavity at the right top is almost closed. There has been little effect on the left apical cavity to date.

Discussion: Pneumoperitoneum here seemed to promptly initiate a marked improvement in this patient's condition which had shown but little change under bed rest, except for lavatory privileges, for 10 months, when she was first seen by us.

The plan here is to continue the present regime for a comparatively short period of time, after which surgery will be feasible to attempt to close the cavity in the left upper lobe. A surgical attack on the cavity in the right lung may be attempted at that time if it has not already closed as seems probable at present. When the pulmonary cavities are closed, and the sputum negative, and before the patient becomes ambulatory, a fusion operation on the spine will be done.

It would seem here that pneumoperitoneum, while it has not solved the patient's entire problem, has been a distinct aid in the resolution of her exudative lesions, and

brought her physical condition to a point where further collapse therapy is possible.

(2) *D. W.*, age 28, white, American married male, native of Montana. Occupation, truck driver.

In January, 1935, this patient felt badly, lost weight, had a slight morning cough. He consulted a physician and was given a "tonic." No x-ray or sputum examination made. Cough persisted, in November, 1935 a severe attack of influenza, but continued working. Since that time he tired easily, felt weak, and noted increased loss of weight. December, 1935, consulted a physician who did a Von Pirquet which was negative, so no x-ray examination was made. January 1936, he had night sweats and from that time on his cough became more productive. Then, because of weakness, he returned to his home in Montana for a "change of climate." At this time he consulted another physician, and x-rays showed far advanced bilateral pulmonary tuberculosis with bilateral cavitation. This was apparently an old fibrotic pulmonary tuberculosis with a large cavity in the upper portion of his right lung, and a more recent extension with acute cavity formation throughout the left.

When seen by us in June, 1936, he was extremely toxic, dyspnoea, febrile. On absolute bed rest his dyspnoea improved so that an attempt was made to establish a right artificial pneumothorax without success. Diarrhea with soft movements and much pain, averaging 10-12 B.M. per day, occasionally as high as 15, had started some weeks previously.

Pneumoperitoneum was initiated; refills being given at weekly intervals, averaging 800-1000 cc., with at first very slow response. After 4 months, there was a marked improvement in his general condition. Sputum reduced from 48 to 14 cc., B.M. reduced to 3 a day without pain. Pneumoperitoneum continued with slow gain in weight, and slight reduction of sputum. July, 1937, B. M. became formed and normal, weight satisfactorily increased. He had been afebrile since January, 1938. Sputum a trace, but still positive for tubercle bacilli. Sputum disappeared for the past 3 months. Excellent general condition. Pneumoperitoneum being continued. Smooth diet. No bowel symptoms of any kind. Chest x-ray shows 2 small fibrotic cavities in the left subclavicular region, and a 3 cm. single fibrotic cavity posteriorly at the right apex. The patient's condition is now such that surgical collapse of these cavities can be attempted if a left artificial pneumothorax is not successful.

Discussion: This illustrates again what looked like an entirely hopeless situation, the result of what seems to be almost gross mismanagement, brought to a point where the problem of infection has been controlled by pneumoperitoneum plus hygiene, and that the resulting mechanical problem, that is the bilateral cavitation, can be attacked safely by adequate surgery.

(3) *A. P.*, age 53, American white, married, male. Proprietor of a liquor tavern.

Fistula-in-ano 1915; persisted for 5 months. No recurrence. 1922 felt poorly, lost weight, and had haemoptysis. Physicians advised that he spend several months in a health resort, no sanatorium treatment. Several months later he had another small haemoptysis, but since then remained perfectly well until the onset of his present illness.

He had much clearing of his throat in the morning for the past several years. In January, 1937, he had an acute respiratory infection. Recovered in 4 days, but following this his cough increased and became more productive. April 13, 1937, he had a trace of blood in his sputum which he disregarded, and the following day he had a haemoptysis of 6 ozs. He was placed at bed rest by his physician. 0n April 30th, an x-ray film showed an extensive acute pneumonic tuberculous infiltration involving his right upper lobe with a small cavity placed posteriorly at the apex. He was seen by us in May, 1937, and was placed at absolute bed rest. Repeated attempts to establish a right artificial pneumothorax were not successful. Pneumoperitoneum was established May 24, 1937. June 7th a right temporary phrenic nerve paralysis was done.

This combination resulted in good rise of the right leaf of the diaphragm. Pneumoperitoneum refills of 1000 cc. were given at weekly intervals. He promptly became afebrile; lost all of his toxic symptoms. Sputum has been persistently negative since August, 1937, except one positive sputum in January, 1938, with an acute respiratory infection; all subsequent examinations nega-

tive. There has been no sputum since February, 1938. The cavity is closed by x-ray and the patient has been ambulatory since October, 1937, and at full-time work since January, 1938.

Discussion: This illustrates the fortunate occurrence of the closing of an apical cavity with the combined use of a phrenic operation plus pneumoperitoneum. These procedures were initiated particularly with respect to the acute exudative involvement in the right upper lobe. Such a marked rise in the diaphragm occurred and the mechanics of the chest were so altered, that closure of the cavity resulted. Whether this was from pressure, from relaxation of fibrous tissue, or changing the contour of the bronchus draining the cavity, is not clear. The final result is none the less satisfactory.

It is planned to continue this pneumoperitoneum on the present basis for at least another year. The temporary phrenic still paralyzes the diaphragm. This man's general physical condition is such that he would stand major surgery poorly, and the combination of methods used has resulted in a good clinical result.

(4) *M. G. L.*, age 20, white male. Native of Scotland. Occupation, bookkeeper.

No tuberculosis contact known. July, 1936, had severe left pleuritic pain. No medical attention. Recurred in November, 1936, associated with malaise and temperature to 104'F, lasting one week. This was considered by physician as pneumonia. He remained at bed rest for 2½ months, and returned to work in January, 1937. One month after this first attack, a similar episode recurred for which he remained in bed 6 weeks. September 15, 1937, he noted malaise, and recurrence of his left-sided pain.

When seen by us at that time he had a low-grade fever, no loss of weight, excellent general condition. X-ray showed bilateral infiltration of both upper lobes without cavity formation. No sputum obtainable. Stomach wash was positive for tubercle bacilli by guinea pig inoculation.

A period of institutional care with absolute bed rest for 2 months beginning October 14, 1937. During this time an attempt was made to start first a left, then a right artificial pneumothorax without success, because of obliterative pleuritis. The patient had great difficulty in settling down to a hygienic regime. Both he and his family seemed to lack the background necessary to take the cure properly. In their experience, tuberculosis had always been a fatal disease, and their fears regarding this patient were extreme. Because of finances, only a short stay in a private sanatorium was possible, and public sanatorium care was absolutely refused. Pneumoperitoneum was initiated November 8, 1937, with excellent technical result. The patient has been kept at absolute bed rest until this time.

Discussion: From our previous experience with patients of this type, it would seem it is quite impossible for them to follow a hygienic regime over any period of time. Whether the good result obtained from pneumoperitoneum in this type of patient is on the same basis as some men ascribed the use of tuberculin many years ago; that is, "the laying on of hands," and the necessity for periodic reporting for a definite procedure, was its greatest virtue, is, of course, open to question. It is difficult to describe the exact clinical picture and relations in this family, but I seriously question whether an absolute bed rest regime alone would have been possible here.

The question as to whether pneumoperitoneum is too serious a procedure to initiate in this type of tuberculosis may also be raised. Extensive bilateral lesions, which are slowly infiltrating over a period of 18 months, in a 20 year old boy, who is not particularly cooperative, is a problem that requires drastic action of some type. It is perfectly true that this type of lesion, under prolonged bed rest, will usually give us an excellent permanent clinical result. I believe that is by all means the best method of approach. I further believe that no other method should be undertaken lightly. But it is also very important to be keenly aware of not only the physical, but psychological problems involved in the individual patient. Where there is rather definite assurance that some other measure will be necessary, in our hands at least, pneumoperitoneum has proven a satisfactory tool in this type of case. I do not believe that it should be widely used for this indication, but when necessary, we have no hesitancy in advising it. It may well be that some other method may prove just as satis-

factory.

We have previously reported certain cases that with the use of pneumoperitoneum have been interesting clinical cures; that is, with the use of pneumoperitoneum alone the cavity has been closed, sputum rendered negative, and the patient returned to a full-day's work at his previous occupation. Such results continue to be found occasionally, but are not the rule, particularly with regard to closure of the larger cavity.

At the other end of the clinical picture there comes a point where no therapeutic measure at our command seems to be indicated. It would seem that pneumoperitoneum can be used in a patient who is more seriously ill with bilateral pulmonary tuberculosis than any other measure, except the fundamental one of bed rest under proper sanatorium conditions. I hope that no statement we have made would tend to minimize the value of absolute bed rest in an adequate institution. However, we must recognize that while this alone occasionally will produce dramatic results, it has been our personal experience, as well as that of most of the clinicians who have tried pneumoperitoneum on a sufficient scale, that the results with pneumoperitoneum compared to the results without its use justify its continuance.

To date we have given over 5000 refills in some 250 cases. Out of 46 deaths, 20 autopsies have been obtained, and a study is now in progress of the pathology of the peritoneum. On the basis of these findings, we have found nothing to change our previous opinion of the use of this procedure where it is reasonably indicated. We hope eventually to obtain figures that will be statistically significant. It may be necessary to pool cases from various institutions for this purpose. However, one must always compare a procedure of this type with like cases who have received bed rest alone. That should not be a difficult matter, and would give more exact results.

Working more or less as a group locally, and with the added information obtained in other localities where pneumoperitoneum has been used for the last few years, it would seem that our initial favorable reaction toward the results obtained was not mere unwarranted enthusiasm for a new method but that results to date warrant its continued application.

Surgical Resources in the Treatment of Pulmonary Tuberculosis

AMBROSE S. CHURCHILL, M.D.; JOHN R. PAXTON, M.D.; AND JANE SKILLEN, M.D.*
Olive View, California

THE day is long past when the treatment of pulmonary tuberculosis might be dismissed with the vague recommendation for fresh air, diet and rest. Each stage and condition in the course of the infection now represents explicit indications for specific forms of surgical intervention, and the correct prescription of such operations has developed into a fine art. Only in the few truly minimal cases, where there is no evidence of progression of the disease under bed rest, is consideration of surgery omitted. Any sign of advancing disease, tissue destruction or cavity is a signal for specific procedures of an operative nature.

Artificial pneumothorax is by far the most popular and most firmly established of the modern active measures in treating tuberculosis. Any patient in whom a successful pneumothorax can be established on the affected side while the other is still uninvolved may indeed consider himself fortunate.

Since the introduction of artificial intrapleural pneumothorax in 1892, by Forlanini, there have been great strides made in the perfection of technique, broadening of indications for its use, better understanding of its contra-indications, and increased knowledge in the diagnosis and treatment of its complications. An incomplete and unsuccessful pneumothorax should be abandoned before serious complications arise, and before

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valuable time is lost in attempting to make a success out of an unsuccessful pneumothorax.

A successful artificial pneumothorax, however, is not now abandoned in the average case merely because there has been a spread to the opposite side. To-day some form of collapse therapy may often be instituted on the contralateral side. Bilateral intrapleural pneumothorax is no longer considered an extreme measure, nor an exceptionally hazardouz undertaking, although its risk is considered greater than that of unilateral pneumothorax.

In 1913 Jacobaeus of Stockholm devised a method of severing intrapleural adhesions in an incomplete pneumothorax in which the adhesions prevent a satisfactory collapse of the diseased lung. The procedure is widely used to-day by surgeons and has saved many a patient from a thoracoplasty, or other major chest surgery.

In cases in which the adhesions are too extensive for safe closed intrapleural pneumolysis but still possible for cutting, the open intrapleural pneumolysis may be used.

Pneumoperitoneum or oxyperitoneum was used as long ago as 1900 by Bainbridge. Pneumoperitoneum was used primarily in the treatment of intestinal and tuberculous peritonitis, and only in very recent years has it been used in the treatment of pulmonary lesions. The results have been gratifying in many cases, particularly from the systematic relief, with a decrease of cough and sputum and gain of weight often experienced. Since the early work on phrenic nerve paralysis, and especially by the clinical application by Stuertz, Sauerbruch, Goetz and Felix, great strides have been made, both in technique and indications, as well as in combinations with other surgical procedures. From the early avulsion, exaeresis or permanent paralysis, although still often used, most American workers have followed Alexander in the use of mere crushing of the nerve and resection of the accessories nerves, the temporary phrenic paralysis or phrenemphraxis. Its results, either alone or in combination have made it a valuable procedure in the armamentarium of the surgeon.

Another minor surgical procedure to be used alone, or in combination with phrenic nerve paralysis, was Scaleniotomy or Scalenectomy, proposed by Kochs, Els and Junkersdorf in 1930. The operation was proposed to allow the upper ribs to drop downward and inward, particularly when used with phrenic nerve paralysis. The operation enjoyed popularity for several years, and although still used in some clinics, it has been generally replaced by other more effective procedures. In 1913 Schepelman performed multiple intercostal neurectomies on experimental animals, and Friedrich in the same year performed the operation on a patient with tuberculosis. The operation was used to limit the amount of costal movement and decrease the capacity of the chest on that side. This procedure, either alone or in conjunction with other measures of collapse therapy, is also now seldom utilized.

DeCerenville in 1885 resected portions of ribs of the chest wall to allow collapse of the underlying diseased tuberculous lung, the first thoracoplasty done for the treatment of pulmonary tuberculosis. Other early surgeons to do thoracoplasties were Brauer, Friedrich, Wilms and Sauerbruch. Through the early work of these pioneers the modern thoracoplasty has been developed. With the replacement of the early paravertebral thoracoplasty in which short pieces of all ribs were removed at one operation by the removal of a few ribs, at a stage either in part or total length, there has been a marked reduction in the mortality of the operation.

Recent developments in thoracoplasty technique to allow closure of cavities lying close to the midline, or the so-called paravertebral gutter, are the disarticulation of the rib posteriorly and resection of the transverse processes, and apicolysis, or the freeing of the lung from the mediastinum and paravertebral gutter external to the endothoracic fascia, as proposed by Semb, or subfascially as performed by other operators.

A similar less extensive operation usually restricted to a definite type of apical lesion is Apicolysis. In this procedure a small section of one rib is removed posteriorly and the apex is freed, allowing the lung to drop downward and collapse, leaving a dead space. This is an extrapleural pneumolysis, and was first advocated and used by Tuffier in 1891 on a patient with pulmonary tuberculosis. Baer in 1910 filled the space with paraffin, the so called Wax Plombage. Since this time

many other substances have been suggested and used for the filling of this space, among them being gum-sheeting, rubber bags, gauze, and the pectoral muscle and fat.

More recently air has been repeatedly injected into the extra-pleural space instead of wax or other materials. Owing mainly to inadequate technique, the first few cases were generally unsuccessful. Lately other workers have improved the procedure, making and maintaining collapse sufficiently, and hundreds of cases have been so treated successfully. Oil has also been used instead of air in this procedure, especially in cases of diminishing collapse.

The most formidable surgical procedures employed in the treatment of pulmonary tuberculosis are lobectomy and pneumonectomy, the removal of a lobe or an entire lung on one side. Though rarely utilized, these have a definite place, particularly in cases in which cavity closure and sputum conversion cannot be accomplished by an apparently maximal thoracoplasty or in cases in which advanced tracheobronchial stenosis or obstruction renders surgical "compression" procedures ineffective, or in which the bronchial involvement has already lead to the development of a mixed tuberculous bronchiectasis.

Tracheobronchial tuberculosis may be recognized by the frequent use of the bronchoscope. Every patient should be bronchoscoped before thoracoplasty, extrapleural pneumothorax or pulmonary amputations. Any patient who presents any symptoms, physical signs or radiological evidence suggesting tracheobronchial tuberculosis should also receive this diagnostic measure. The bronchoscope may also be used for direct therapeutic purposes. The treatment of ulcerative tracheobronchial lesions by chemical or electro-cauterization has yielded gratifying results.

Pulmonary tuberculosis can not be treated by operative means alone with the neglect of skillful medical management if the best results are to be obtained. It is just as important to realize, however, that no patient should be treated, today, for pulmonary tuberculosis without consideration of the possibilities of the varied resources of modern surgery.

NOTICE

The Second Annual Tuberculosis Seminar, at Asheville, will be held July 11-16. The number of physicians to take the course will be limited to twenty and the fee will be $10.00. Special attention will be given to early diagnosis and to both surgical and medical treatment. Outstanding laboratory and clinical facilities are available. Applications will be acted upon in the order in which they are received and prompt action is necessary for those who wish to avail themselves of this opportunity.

For Further Particulars Write To:

KARL SCHAFFLE, M.D.

Chairman, Tuberculosis Seminar

Asheville, North Carolina

California Biographies Continued

JOHN C. KING, M.D.

(Continued from page 8)

Dr. King served on the local school board for twenty-one years. He was instrumental in obtaining a high school for Banning, years earlier than it would have developed by normal growth.

Dr. King, at the age of eighty-five, is in comparatively good health and lives in Pasadena, California. —A. L. B.

CHARLES CLIFTON BROWNING, M.D.

(Continued from page 8)

berculosis Association, and is now an honorary member.

In 1910 he took charge of the Tuberculosis Department of the Los Angeles County Hospital, and continued in that capacity until his retirement in 1932. In the early part of the world war he served as contract surgeon. Later, in response to his urgent request for permission to enter the regular services although he was well over the age limit, he was given a special dispensation to enlist. During the influenza epidemic and the balance of the war he was in charge of the Medical Services at Fort McArthur.

Like all the pioneers in tuberculosis in California, his career followed the example of Dr. Trudeau in his efforts to help those suffering from tuberculosis who could not help themselves. Certainly it can be said of him "To each he gave the best he had to give." —C. H.

FRANCIS MARION POTTENGER, M.D.

(Continued from page 9)

Doctor Pottenger has been active in many tuberculosis organizations. He has served on the Board of Directors of the Los Angeles Tuberculosis and Health Association since 1924; President, California Tuberculosis Assn., 1931-32; Secretary, 1937- ; and served on the Board of Directors since 1930; member of the National Tuberculosis Association (Director, 1930-34); International Union Against Tuberculosis; American College of Chest Physicians; American Academy of Tuberculosis Physicians; honorary member of the Tuberculosis Society of Scotland.

He is a member of the Los Angeles County Medical Assn. (President, 1906-07); Los Angeles Clinical and Pathological Society (President, 1923-24); Trudeau Society of Los Angeles (President, 1935-36); Southern California Medical Society (President, 1912-13); California Medical Association; Pacific Interurban Clinical Club (Chairman, 1931-32); California Academy of Medicine; Hollywood Academy of Medicine (honorary).

Doctor Pottenger is also a member of numerous national organizations: American Medical Assn.; Fellow of American College of Physicians (Councilor, 1916-23); Regent 1923-29, and Regent 1933- ; President 1932-33; American Therapeutic Society (President 1914-15; Councilor since 1906); Association for the Study of Internal Secretions (Secretary from 1917-35; President 1935-37; Councilor 1917-). American Climatological and Clinical Association; American Association for the Study of Allergy; American Public Health Association; American Sanatorium Association (President 1924-25); American Heart Association; Association for the Advancement of Science; Science League of America; Fellow, National Geographic Society; Founder member of the Pacific Geographic Society (Board of Regents 1929-33); American Academy of Political and Social Science; and Institute of American Genealogy. He is a member of the Society of Colonial Wars, and the Sons of the Revolution.

He is consultant, Los Angeles County Hospital; Collis P. and Howard Huntington Memorial Hospital, Pasadena, Chairman of Medical Executive Board and Consultant, Los Angeles Sanatorium and Ex-patients Home, Duarte, California. He is Chairman of Tuberculosis Advisory Committee to Department of Charities, Los Angeles County.

He was Trustee of the City of Monrovia, 1899-1900. He has served on the Board of Trustees of Otterbein College, Westerville, Ohio, since 1924.

Doctor Pottenger has always recognized the fact that internal medicine is greater than any specialty. Aside from his interest in tuberculosis he has had special interest in asthma and other allergies, endocrinology and visceral neurology.

He has added many original observations to the clinical side of tuberculosis. In 1909 he described the motor and trophic reflexes in pulmonary tuberculosis, and later classified and described many reflexes from the lung. In 1913 he described the motor reflex from the kidney; (1909) he was the first to describe the ability to palpate deep organs and to outline by touch various pathologic conditions within the thorax. ("Light Touch Palpation"). In 1913 he offered a classification for the symptoms of tuberculosis based on their etiology, showing that all symptoms may be classified into three groups: (1) those produced by the toxins; (2) those of reflex origin; (3) those due to the tuberculous process *per se*.

He is interested in eugenics, and is a member of the Eugenics Society of the U. S. of America.

He has also been a student of economics and sociology, and is much interested in the problems of the day. At present he is Honorary Chairman of the Medical Bureau to Aid Spanish Democracy (Southern California Chapter), and a member of the National Committee of the American Bureau for Medical Aid to China.

Doctor Pottenger has published more than 250 papers on medical subjects, and the following books:

"Pulmonary Tuberculosis" New York City, Wm. Wood and Company, 1908. The following were

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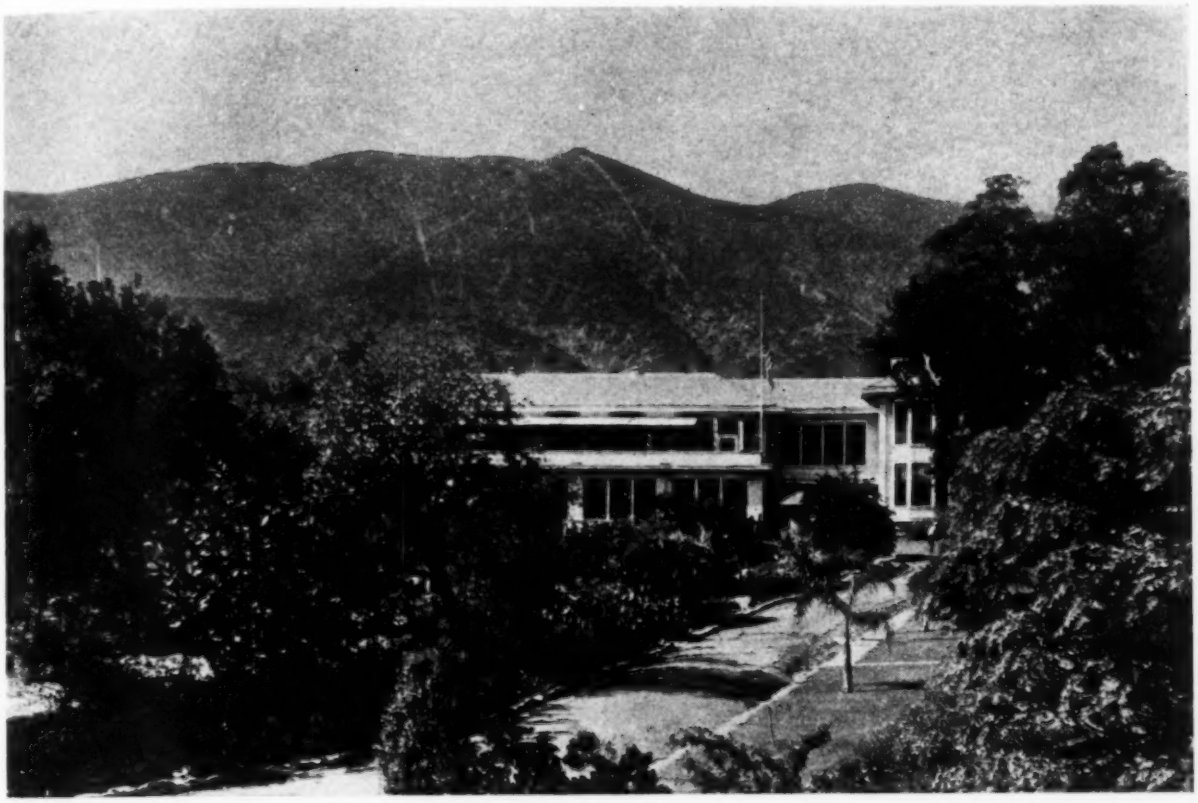


THE POTTENGER SANATORIUM

MONROVIA, CALIFORNIA

THE Pottenger Sanatorium for Diseases of the Chest was opened on December 5, 1903. It had facilities for caring for eleven patients. At the present time its bed capacity is 120.

The sanatorium is located at Monrovia, on the southern slope of the Sierra Madre mountains, at an elevation of 1000 feet, overlooking the San Gabriel valley. The Sierra Madre mountains, north of the sanatorium, rise to an elevation of 6000 feet.

Monrovia lies thirty-five miles inland from the ocean and is sixteen miles from Los Angeles. The climate is moderately dry, midway between that of the ocean and the desert. Monrovia has an all-year-round climate. The summer days for the most part are delightful, and practically every night requires a blanket. The winters are warm and pleasant. Sub-tropical plants grow in the gardens throughout the year.

The sanatorium is situated in the midst of a beautiful park, which adds greatly to the pleasure of the patients.

Close supervision is given by an ample resident medical staff.

Florence E. Mead Hospital

REST HAVEN PREVENTORIUM

SAN DIEGO, CALIFORNIA

Florence E. Mead, President

REST Haven Preventorium is now and for many years, has been one of the leading and the most important branches of the work being done by the San Diego Tuberculosis Association.

Rest Haven Preventorium was opened as a preventorium in 1921 for anemic, contact, and undernourished children; who if unaided were in danger of developing active tuberculosis. These children are admitted after thorough examination in the clinic by one of the staff physicians in charge.

The new Florence E. Mead Hospital of Rest Haven is built, equipped and maintained in full accord with the most modern medical, sanitary, and architectural standards.

Rest Haven Preventorium consists also of a large dining room, with kitchen and store rooms. Three large dormitories with sun porches, two for girls, one for boys and with quarters for nurses. All of these buildings are of modern construction and fully equipped and heated according to state and medical standards.

Rest Haven Preventorium has a full corps of nurses and assistants; prompt aid being available at all times for any child needing care. It also maintains an up to date school with grades from kindergarten to junior high, thus enabling the children to continue with their education whilst their health is being restored; two teachers being provided by the San Diego City Board of Education. A library and play ground is connected with the institution for use of the children. The average number of beds was sixty-two, but with the new hospital, it will be possible to accomodate one hundred and ten children.

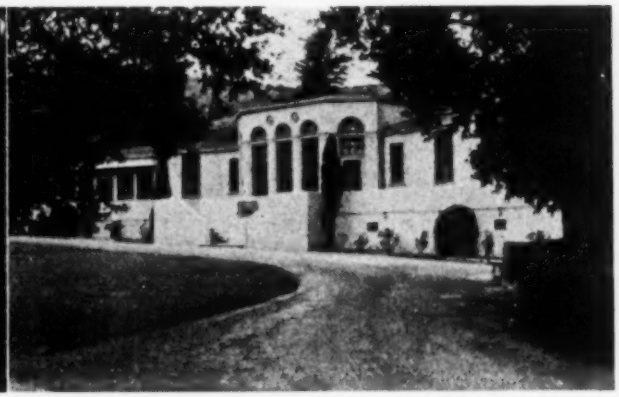
The children at Rest Haven, many of them rescued from an unhappy life of suffering, are being restored to health and usefulness by proper food, outdoor life, sunshine, judicious exercise, rest, and proper sanitary care and treatment. In many cases, they are saved from becoming helpless invalids and a heavy charge upon their family and the community. Rest Haven Preventorium is situated one mile and a half east of San Diego, consisting of eleven acres.

Amongst the outstanding work of the San Diego Tuberculosis Association is its Early Diagnosis Campaign, carried on each year in the public schools and state college. Tuberculin tests and x-rays being given upon request. All contacts if so ordered by the clinic or by private physicians are admitted to Rest Haven Preventorium. In connection with this Early Diagnosis Campaign and Rest Haven an extensive follow-up work is carried on now by a competent graduate nurse.

For further information, write to the San Diego Tuberculosis Association and Rest Haven Preventorium, 1266 7th Street, San Diego, Calif.

California Sanatoria

Tropical Setting of the Administration Building



A View of the Entrance of The Howard Foundation

CALIFORNIA SANATORIUM

BELMONT, CALIFORNIA

THE California Sanatorium, at Belmont, California, was opened in July, 1910—and is located in the Peninsula district twenty-five miles distant from San Francisco, combining the advantages of an equable climate with perfect accessibility to a metropolitan center.

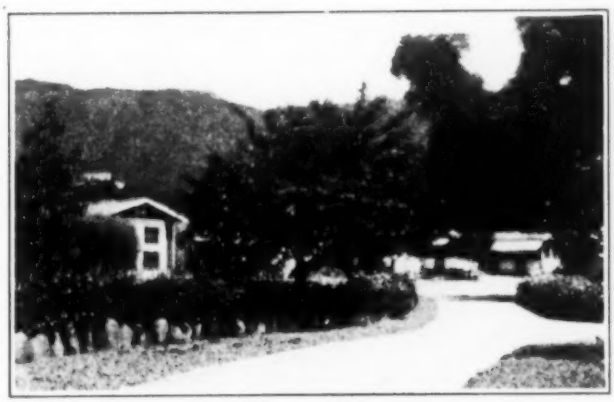
From a beginning of twenty beds it has progressively increased its capacity to one hundred and ten beds. Having weathered the vicissitudes of pioneership, it now offers all advantages and modern therapy for respiratory diseases.

Within the grounds is the Howard Foundation, a twenty bed endowed institution in which children of semi-indigent parents are treated without charge. Their supervision and treatment being directed by the staff of the California Sanatorium. Here many interesting and far reaching experiments and deductions have been made in juvenile tuberculosis.

Dr. Max Rothschild, the founder of the sanatorium, was long an advocate of early isolation, augmented by routine supervision as the only practical course to lessen the incidence of tuberculosis. With great satisfaction he lived to see this idea accepted universally and a national drive made with isolation as its goal.

MARYKNOLL SANATORIUM

MONROVIA, CALIFORNIA

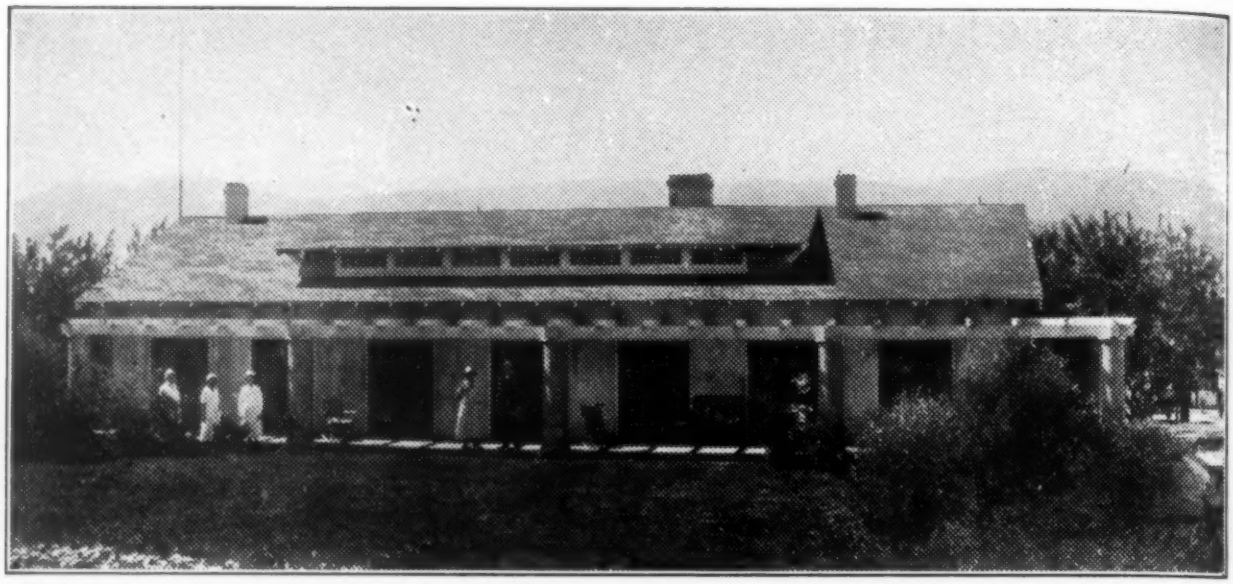


THE Maryknoll Sanatorium is located in Monrovia, California. It is eighteen miles east of the center of Los Angeles and is connected with the metropolitan area by several different automobile highways and by the Pacific Electric Interurban Railway. The sanatorium is situated in the foothills on a southern slope at the base of the mountains in one of the most delightful all year-round climates in the United States. This institution is privately owned and, being comparatively small, the essential control of the individual patient is not difficult.

The Maryknoll Sanatorium was originally established seventeen years ago as a small rest home and has gradually grown to its present capacity of fifty beds. It is owned and operated by the Maryknoll Order of Catholic Sisters. The accommodations are private and semi-private and all are modern in equipment. The rates, including medical attention, vary from thirty to thirty-five dollars a week.

For information address Sister Mary Ellen, Superior in Charge or E. W. Hayes, M.D., Medical Director.

California Sanatoria



BANNING HOSPITAL AND SANATORIUM

BANNING, CALIFORNIA

THE Banning Hospital and Sanatorium was founded about 1910 by Dr. John C. King. From a very small beginning, it had a consistent growth to its present capacity for thirty patients. Dr. A. L. Bramkamp, the present medical director, associated himself with Dr. King in 1919, and in 1922, Dr. King retired from active practice and moved to Pasadena, California; where he now resides.

The hospital and sanatorium is equipped for modern surgery and the cottages which house the patients are constructed to assure patients the utmost comfort and privacy.

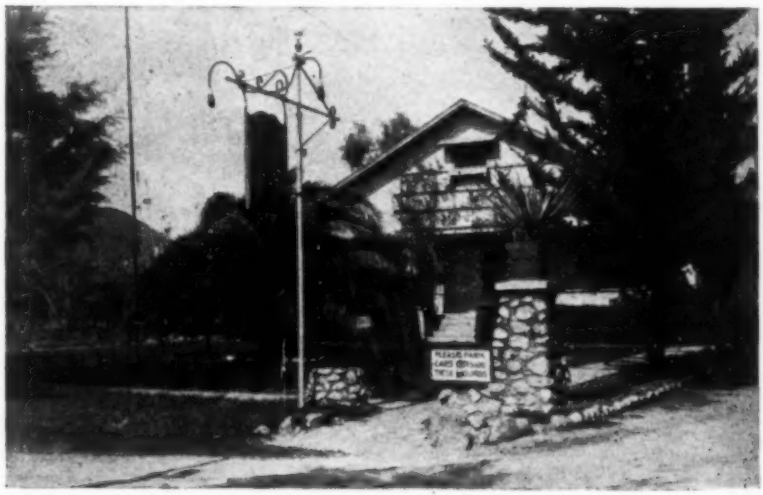
Private individual care, in pleasant surroundings, and under competent medical direction can be obtained at the Banning Hospital and Sanatorium.

The hospital is privately owned and the rates which include medical care are very reasonable. Write for attractive booklet.

SOUTHERN SIERRAS SANATORIUM

BANNING

CALIFORNIA



THE Southern Sierras Sanatorium, Banning, California, was established January 1, 1913, by the late Dr. L. M. Ryan, who operated the sanatorium on a high scientific plane until about 1919.

Subsequently the sanatorium changed hands a number of times and in 1926 was purchased by Dr. C. E. Atkinson, who at that time had been doing tuberculosis work for thirteen years. Since then Dr. Atkinson has served as Medical Director and under his direction the sanatorium has prospered and has earned a sustained reputation for satisfaction.

Dr. Atkinson had been in general practice in Los Angeles for several years until his health broke down in 1912. He then moved to Monrovia where he was engaged in tuberculosis work for about two years. In 1915, for health reasons, he came to Banning where he continued his tuberculosis practice and was among those in this country who early recognized the value of artificial pneumothorax as a method of treatment.

With an inspiring view of high mountain peaks on either side, the sanatorium is situated about one mile north of Banning at an elevation of twenty-five hundred feet. Amid a general atmosphere of quiet contentment, modern, established methods of treatment are availed of fully, and each year the roster shows an increasing number of persons restored to useful and happy lives.

California Sanatoria

CANYON SANATORIUM

REDWOOD CITY, CALIFORNIA

CANYON Sanatorium was founded in 1916 by Dr. Ralph B. Scheier, the present medical director.

The Sanatorium is located three and a half miles from Redwood City, San Mateo County, California, thirty miles south of San Francisco. Nestled in the foothills, protected from the fog and wind, the Sanatorium partakes of a natural beauty that lends an atmosphere of contentment so conducive to the mental welfare of the patient. Surrounding the Sanatorium is mountainous country covered with evergreen oaks.

Our cottage plan of construction is ideal. Being favored by a climate that permits living in the open the entire year, the individual cottage or bungalow affords an excellent means of enabling the patient to lead a continuous open-air life.

Each patient occupies a separate cottage (except in cases where a mutual combination is agreeable), consisting of a sleeping porch and an adjoining dressing room. All of the cottages are lighted by electricity and provided with telephones and hot and cold running water. Adjustable windows permit a maximum of sunshine and fresh air. Steam heat is available as the weather demands.

Our nursing service provides for a care that is unexcelled. Specially trained nurses carry out the orders of the medical staff and at all times cheerfully administer to the comfort of the patients.

"A Typical Bungalow"

The rates are moderate, ranging from $25.00 per week and upward and include general nursing, room and board, all ordinary medication and services rendered by the medical staff.

For further information write, Ralph B. Scheier, M.D., Medical Director, 516 Sutter St., San Francisco, Calif.

THE OAKS SANITARIUM

LOS GATOS, CALIFORNIA

THE Oaks Sanitarium, located at Los Gatos, California, two miles south of the picturesque town of Los Gatos and lying in the foot-hills of the Santa Cruz Mountains, was twenty-four years old on the first of February, 1938. It started from very small beginnings. When it was taken over by the present management the few tent-cottages existing were demolished and a modern up-to-date institution was built.

The institution has fulfilled its destiny by living up to the slogan by which it came into existence, namely, "A moderately priced institution for the scientific treatment of tuberculosis." From small beginnings The Oaks Sanitarium has developed into an institution of sixty beds and is thoroughly equipped from a clinical, laboratory, roentgenological and sociological aspects to cope with all forms of tuberculosis and chronic pulmonary diseases along the most modern and accepted lines of treatment. The Sanitarium maintains in addition to its cottages and other buildings a partially endowed building which houses twenty-two patients and in which patients are accepted at a minimal rate of $25.00 per week. The Sanitarium also maintains a model farm and dairy. Personal service, good food, and proper medical attention; we consider the three reasons for our success. A booklet containing full information will be furnished upon request. William C. Voorsanger, M.D., F.A.C.P., is the Medical Director.

California Sanatoria

VETERANS' HOSPITAL

LIVERMORE
CALIFORNIA

FRANK B. BREWER, M.D.
Manager

WHEN the Congress authorized the establishment of a Veterans' Hospital for the treatment of tuberculosis and its complications in the San Francisco Bay area district, a survey of available sites was made. Climatic considerations were involved, and it was found that the Livermore Valley presented conditions more nearly approaching those considered ideal than any available section. Nestled on a plateau in the Livermore mountains, the Livermore Valley enjoys the sunshine and warmth of the San Joaquin Valley district, tempered by the influence of San Francisco bay atmospheric conditions.

The original construction provided 306 beds. The institution was opened in April, 1925. The capacity as of March, 1938, is 312. Additional single rooms under construction will bring this capacity to 340.

With the exception of a few months in 1933, immediately following the passage of the so-called Economy Act, admissions have been limited to individuals suffering with pulmonary tuberculosis and its complications. General medical and surgical patients were received for a time in 1933.

The standard procedures for the treatment of tuberculosis are utilized at this institution, including surgical collapse therapy of all types.

VETERANS' HOSPITAL

SAN FERNANDO, CALIFORNIA

D. C. FARNSWORTH, M.D., Manager

THE Veterans' Administration at San Fernando, built by the Government and officially opened February 22, 1926, is located in the foothills of the San Gabriel range of the Sierra Madre Mountains. It is a modern hospital maintained for the treatment of veterans of the army, navy, marine, and army nursing corp. Towering mountains rise above, and the historical San Fernando Valley lies below. In addition to the original natural beauty of 616.6 acres comprising the hospital reservation the hospital site in further beautified by tree-lined roads, shady walks, green lawns, and beautiful flowers. The 40 buildings are Spanish architecture, in keeping with the nearby old Spanish Missions and early California traditions. Only the occasional hum of an airplane overhead, or a distant motor, indicate the close proximity of the busy metropolis of Los Angeles, 26 miles away. Thus the atmosphere of peace and quiet is preserved, where the sick can obtain rest from a busy world and at the same time cure in a modern hospital,—aptly expressed in a letter of appreciation by a former patient to the Manager, "although I received all the modern treatment of medicine and surgery for my lung condition, I felt that I had been treated as a guest of a friend in his country estate." The climate has been acclaimed by phthisiologists and other health experts as ideal for the treatment of chronic illness such as tuberculosis. The Santa Monica hills on the south provide freedom from fog, thus giving a large number of days of sunshine each year. Average summer temperature is between 55 and 87 degrees; winter average is between 45 and 70 degrees. The altitude at hospital proper is between 1650 and 1750 feet elevation.

This institution has every convenience and equipment necessary for modern therapy in the treatment of tuberculosis. It has been given a fully approved rating by the American College of Surgeons. Every department is manned by a group of highly-trained personnel and specialists. The hospital is designated as the Chest Surgery Center for this area, thus receives patients for collapse therapy not only from California but from surrounding areas, and is recognized as one of the leading government institutions in this modern field of tuberculosis therapy. The requests for treatment at this institution have become so numerous that present bed capacity is not adequate. A new modern infirmary building of 109 beds is now under construction, and will be completed early in January. This new building will contain all of the facilities and conveniences for modern hospitalization.

California Sanatoria

OLIVE VIEW SANATORIUM

OLIVE VIEW, CALIFORNIA

OLIVE View Sanatorium was established by Los Angeles County in November, 1920, in the foothills of the San Gabriel Mountains, 26 miles from the center of Los Angeles. The original capacity was 95 patients, which has been increased to 989, with adequate provision for the care and treatment of all types of tuberculosis. An additional 900 patients are cared for in Outside Sanatoria, under the supervision of Olive View. It is the largest sanatorium in California, and one of the largest institutions in the country.

Consulting specialists from the city supplement the work of the medical staff of 21 physicians.

Beautifully landscaped grounds and terraced hillsides provide a background both pleasant and restful for the long period of taking the cure.

The affairs of the institution are administered by Arthur J. Will, Executive Superintendent, and Edwin S. Bennett, M.D., Medical Director. The Post Office address is Olive View, California.

THE BARLOW SANATORIUM

LOS ANGELES, CALIFORNIA

THE Barlow Sanatorium was founded by the late Dr. W. Jarvis Barlow in 1901, when twenty-five acres in Chavez Ravine, Los Angeles, were purchased. In 1902 the first buildings were erected.

The purpose of the Sanatorium was to care for residents of Los Angeles County suffering with pulmonary tuberculosis in the curable stages, who could not afford to go to private sanatoria. At that time there were no institutions where people of small means could go and Dr. Barlow realized at that early date that curing tuberculosis required a longer period than most people could finance.

Opening the first two buildings in September, 1903, with four patients, the institution has grown to one hundred beds which is the agreed limit of its capacity. It is non-sectarian. The charges have always been about one-half the actual cost, the deficit being made up by private subscriptions and interest on an endowment fund that was raised by Dr. Barlow.

In the early years the open air cottage system was used almost entirely, there being only a comparatively few infirmary beds available, but as the treatment of tuberculosis has changed, more and more hospital beds have been added until it has reached a point where over seventy-five per cent of the patients are bed cases. This is partly due to the fact that many of them have some form of surgery.

Over thirty-four hundred patients have been treated during the thirty-four years of the Sanatorium's existence and there is always a waiting list of applicants, residents of Los Angeles County being given preference. Dr. Munford Smith was medical director of the sanatorium at the time of his death in 1937. Dr. Howard Bosworth succeeded him.

California Sanatoria

(Proposed Building, taken from Architect's drawing)

VAUCLAIN HOME

SAN DIEGO, CALIFORNIA

THE Vauclain Home was named after Mr. J. A. P. Vauclain who came to San Diego from Pennsylvania in 1887 for tuberculosis. He died in 1929 and he bequeathed one-third of his estate, amounting to $36,-605.36 towards the establishing of the present sanatorium. Dr. A. Morgan was the first physician in charge of the sanatorium and he was assisted by Dr. Anderson.

The first sanatorium was comprised of tents and cottages and these were destroyed by fire in 1918. The following year, the County of San Diego built a new building to which were subsequently added, porches, a childrens' pavilion, a building for ambulatory male patients, and a womens' infirmary.

Plans have been drawn for new buildings, as shown above. When completed, it will accomodate 116 patients and it will eventually house 300 patients at an approximated cost of $600,000.

Dr. S. A. Parowski is the present medical director and he has served in that capacity since 1928. The Vauclain Home has facilities for routine treatment as well as for surgical procedures. An out-patient department is maintained where about 80 patients receive collapse therapy. Chest clinics are held several days during each week.

The present buildings have far outlived their usefulness and the new buildings will give San Diego County proper facilities for the care and treatment of its tuberculous citizens.

ORANGE COUNTY TUBERCULOSIS PAVILION

ORANGE, CALIFORNIA

H. E. Zaiser, M.D., Superintendent

THE above building was built in 1928 and the first patients were admitted to the wards in October of that year. It is a stucco building being built in a beautiful setting surrounded by valencia orange trees. It has a capacity of 130 patients. The department is subsidized and is administered under the same administration as the general hospital which is located on the same grounds.

There is a full time resident physician in the department, one supervising nurse, five graduate nurses, fifteen attendants and one orderly. Dr. E. W. Hayes, Monrovia, California, is in charge of the tuberculosis division and he visits the hospital one day each month at which time he also conducts a clinic in the out-patient department of the general hospital. Dr. Waldo Wehrly of Santa Ana, California is a member of the visiting staff.

California Sanatoria

ARROYO SANATORIUM
LIVERMORE, CALIFORNIA

IN the foothills of the Livermore mountains lies Arroyo Sanatorium, the tuberculosis sanatorium of Alameda County. It was established twenty years ago as the first county sanatorium built under the state subsidy law. The capacity is 190 beds. It operates in conjunction with the tuberculosis department of Fairmont Hospital (San Leandro) which is the admission department, thoracic surgical unit, and chronic custodial care ward of the Alameda County Tuberculosis Service. Chest clinics are located in the principal cities and are also part of the tuberculosis service.

Adjacent to Arroyo Sanatorium is the Del Valle Farm, a childrens' institution. Here there is a ward for children convalescing from various forms of illness, an isolation unit for children with active stages of childhood tuberculosis and bone and joint tuberculosis—and a building, school and playgrounds for mal-nourished and underpar children. Many of these are children from tuberculous families. Del Valle Farm was established by the Alameda County and Health Association but is now operated by the County of Alameda in conjunction with Arroyo.

The tuberculosis service of Alameda County is operated under the direction of the Alameda County Institutions Commission, a board appointed by the county supervisors. Dr. Benjamin W. Black is the medical director of Alameda County and Dr. Chesley Bush is medical superintendent of Arroyo Del Valle and chief of the county tuberculosis service.

SANTA CLARA COUNTY SANATORIUM
SAN JOSE, CALIFORNIA
CHARLES R. IANNE, M.D., Director of Tuberculosis

THE Tuberculosis Division was the first separate unit of the Santa Clara County Hospital and has come up thru crude beginnings to a modern 95 bed Sanatorium.

This Division was first housed in a brick structure which was demolished in the earthquake of 1906. This was replaced by "The Tent" with wooden walls three feet high, screen sides and canvas top. Then came "The Tents," three of them for men and a larger one for women. One wing of the "Pavilion" was built in 1910, consisting of a ward for men and one for women with a rustic living-room between. This room has come up thru many uses and is now a ward and hallway in the present sanatorium.

The Sanatorium was not a PLANNED unit but gradually evolved thru many changes and additions down thru the years. In 1927 a third wing was added but no provision was made for service and administration units, so considerable rearrangement was required to provide for pneumothorax treatment room, laboratory, fluoroscope room, nurses' stations, and doctors' offices. In 1935 two wings were enlarged by the C. W. A. and the S. E. R. A. to take care of the increasing need for beds. The childrens' ward was taken over for women patients which gave a bed capacity of 95 for adults. The children were transferred to one wing of Sunnyholme with a bed capacity of 28. This enabled us to take care of the long waiting list and release one of the wards for a much needed clinic room.

This year we hope to again enlarge the surgical space and improve the kitchen facilities.

The Santa Clara County Sanatorium has evolved thru many vicissitudes, from a few beds for transient patients, with scant supervision, to a modern sanatorium equipped to meet the increasing demands for all forms of collapse therapy which has brought our waiting list down to a minimum.

California Sanatoria

WISH-I-AH SANATORIUM

AUBERRY, CALIFORNIA

NESTLED in the foothills of the Sierra Nevada Mountains, 42 miles from Fresno, is the Fresno County Tuberculosis Sanatorium, situated on a beautiful plateau of 160 acres. Under charge of Dr. Everett Morris, formerly tuberculosis expert in the Federal Government, the institution was officially opened for the reception of patients May 16, 1929, when 7 children entered, the first being an orphan of an ex-service man. Now the institution has accommodations for 69 patients, 17 men, 20 women, 32 children.

The sanatorium is maintained for the care of curable cases of tuberculosis and for children suffering from glandular tuberculosis or undernourished children exposed to tuberculous infection. It is notable for the extensive use of electricity wherever possible and practicable in kitchen, laboratory, and elsewhere. The Wish-i-ah sanatorium has a follow up nurse who searches out contacts and advises them to visit the family physician or the Wish-i-ah lung clinic held by Dr. Morris at the General Hospital in Fresno.

BRET HARTE SANATORIUM

MURPHYS, CALIFORNIA

ELLIOTT PLUMMER SMART, M.D., Medical Director

BRET Harte Sanatorium is located in Murphys, a most scenic and historic town of the Mother Lodge region.

In March, 1928, the official opening took place and Bret Harte was dedicated to the care and rehabilitation of the tuberculous people of San Joaquin and Calaveras Counties.

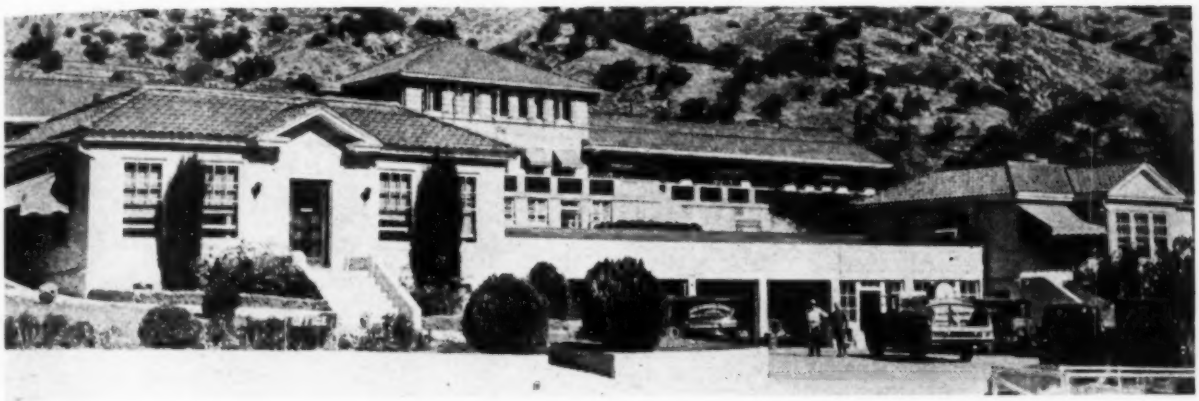
The institution is comprised of a Men's and Women's wing, each with a 47 bed capacity, containing 10 rooms with 6 four-bed cubicles and a porch to accommodate overflow population (which, at the present, is 20 beds over capacity).

The Preventorium, located adjacent to the Sanatorium, has a capacity of 65 children inclusive of a 12 bed Admitting or Isolation Unit, and combines a Boy's and Girls' ward, an auditorium with school-room facilities, and a dining room.

A recreational director sees that amusement is furnished, with a swimming pool the greatest enjoyment.

The decade Bret Harte has operated has seen 1900 patients admitted, many of which have returned to health, happiness and useful occupations.

California Sanatoria



Tulare - Kings Counties Joint Tuberculosis Hospital

Wm. A. Winn, M.D., Medical Director and Superintendent

THIS sanatorium of one hundred and fifty-eight beds is located in the little village of Springville, approximately seventeen miles east of Porterville.

Tulare and Kings Counties together took the first step in erecting a single-story frame building of thirty-six beds and a ten-bed ward unit for men in 1919 at an approximate cost of sixteen thousand dollars. Several years later a class A childrens' building with a schoolroom was constructed, providing accommodations for forty-two. Following this an infirmary with thirteen private rooms and a small surgery was erected and within a year an administrative unit added. Two years ago a new main kitchen and staff dining room with commissary and sleeping quarters for kitchen employees was erected and a new nurses' home built at the same time. During the summer of that year a modern outdoor swimming pool was constructed for the use of the Preventorium children. The money for this construction was donated to the hospital by many different people throughout both counties. Six months ago an eighty-five thousand dollar P. W. A. project was completed, which provided a very modern building for thirty-eight women and children suffering with tuberculosis and two seperate ten-bed ward units for ambulatory patients, one for men and the other for women. The new main building also contains a modern surgical suite and laboratory. At the present time the hospital has the latest equipment for the complete treatment of pulmonary tuberculosis in all its aspects. All forms of surgery are done up to and including thoracoplasties. Diagnostic procedures such as bronchoscopies, bacteriology, guinea pig inoculations, and microscopic pathology are carried out.

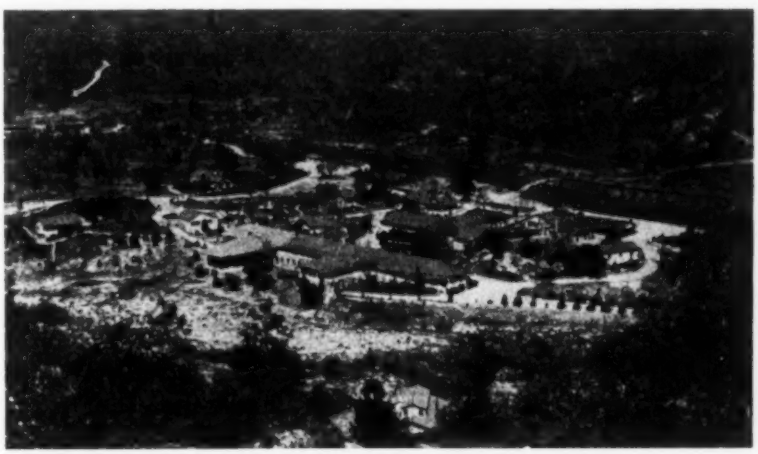
The hospital was first established with Dr. Tracy Melvin at its head. He retired three years ago and the present director replaced him.

The sanatorium maintains an active out-patient department for diagnosis and therapy.

The cost for maintenance and operation is pro-rated, Tulare County 73 per cent and Kings County 27 per cent. The beds are distributed between the two counties in the same proportion.

KERN COUNTY TUBERCULOSIS SANATORIUM

Emerson C. Savage, M.D.,
Medical Director



Stony Brook Retreat

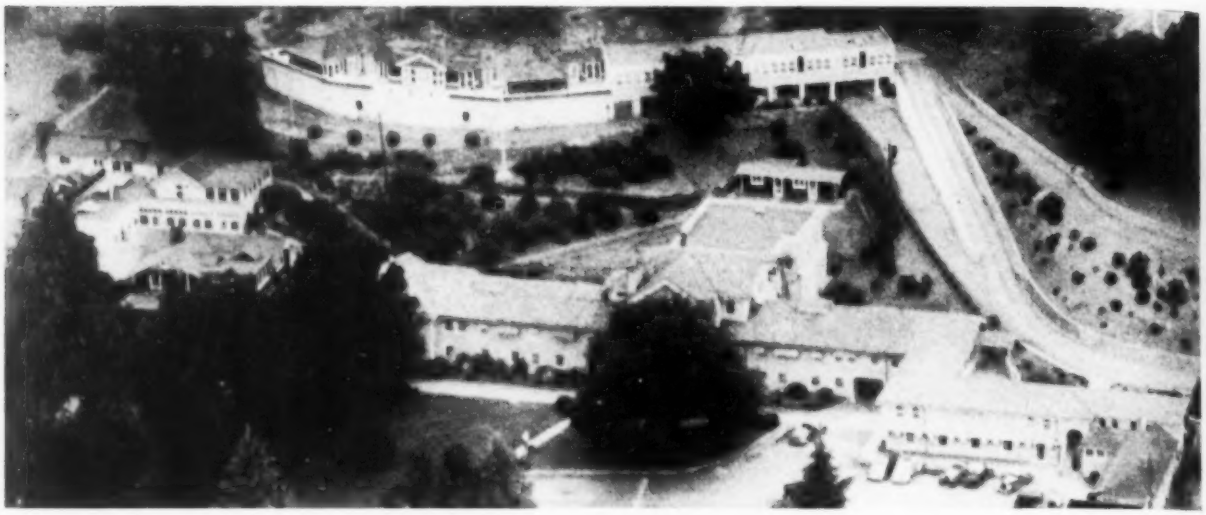
STONY Brook Retreat is the Kern County Tuberculosis Sanatorium and was established in 1919. In 1927 thirty beds were added and the capacity is now 105 beds.

It is located in the Tehachepi mountains, 32 miles from Bakersfield.

Kern County Preventorium was established in 1929. Beds for children, 44. The preventorium is operated in connection with Stony Brook Retreat.

Margaret Kissling is the director of Nurses and there are two resident physicians.

California Sanatoria



Terrace Annex for Tuberculous Patients (Rear Building)

ROSS GENERAL HOSPITAL

ROSS, MARIN COUNTY, CALIFORNIA

Ena M. Bunt, Manager

THE Terrace Annex for Tuberculous patients of the Ross General Hospital was built in 1919 with eight bed capacity as there were no accommodations in the community to take care of tuberculosis cases.

The demands for bed space increased and a nine room addition was built in 1930. A third addition of eight rooms was erected in July, 1936. We now have adequate accommodations for twenty-five patients.

The following equipment is available: Fluoroscope, X-ray, deep therapy lamp, vital capacity machine, facilities for pneumothorax, pneumoperitoneum, thoracoplasties, plombage, and phrenicectomies.

Dr. Sidney J. Shipman became interested in taking charge of this Annex or Sanatorium in 1924 at which time the general hospital was incorporated.

WEIMAR JOINT SANATORIUM

WEIMAR, CALIFORNIA

Mildred Thoren, M.D., Medical Director

ACTING under power of California legislation which provided for the care of tuberculous patients, plans for the establishment of the Weimar Joint Sanatorium were begun in 1917 by a group of Supervisors from several Northern counties of the state, namely—Amador, Colusa, Contra Costa, El Dorado, Placer, Plumas, Sacramento, Sutter, Tuolumne, Yolo, and Yuba.

The site chosen for the Institution is located in the low Sierras, 48 miles east and north of Sacramento on the Lincoln Highway, altitude 2400 feet, climatic conditions ideal.

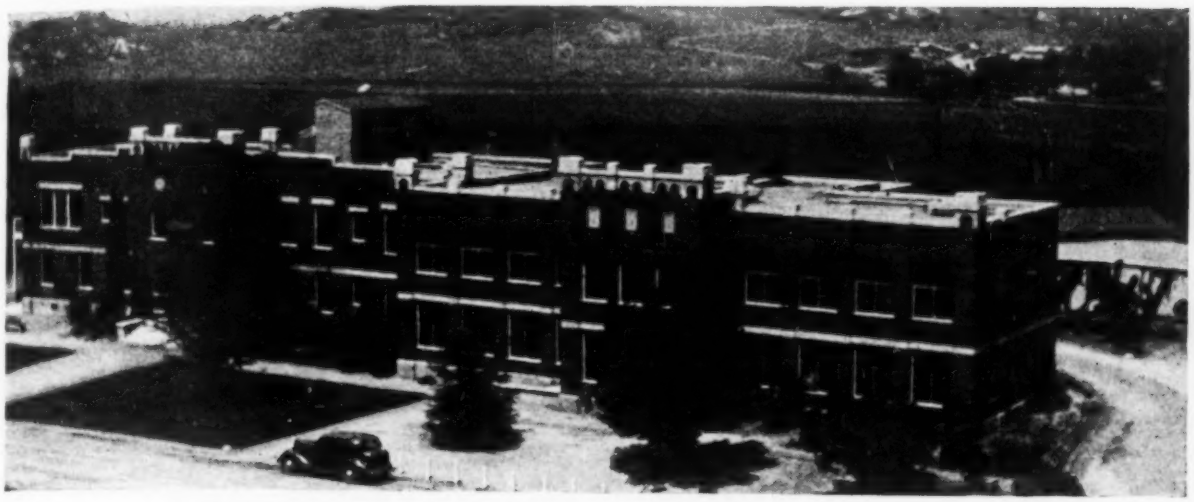
The Sanatorium was completed and opened to patients in November, 1919, supported by the 11 counties mentioned and subsidized by the State. It is a charitable institution and is open to patients of all races and creeds who can satisfy the residence requirements.

Since that time it has expanded to care for about 525 patients at a time and during the past six years Solano and Sierra counties have joined the group.

The Federal Government has recently erected buildings to be used for Indians.

The Sanatorium is fully equipped to care for all stages of pulmonary tuberculosis, intestinal and bone tuberculosis when complicating pulmonary lesions. All methods of treatment are given.

California Sanatoria



Riverside County Tuberculosis Sanatorium

ARLINGTON, CALIFORNIA

JANET REID, M.D., Medical Director

FOR many years the Riverside County Hospital has had a separate building for active tuberculous cases and in 1929 a modern brick building was constructed with all necessary facilities, which at the present time accommodates an average of ninety-two tuberculous patients.

Regular diagnostic and check-up clinics are held under the joint auspices of the Riverside County Health and Tuberculosis Association, the County Health Department and the Riverside County Hospital.

Up to the present time all active tuberculous cases needing county care have been accommodated and we have no waiting list for admission.

San Luis Obispo County Tuberculosis Sanatorium

MELAINE KALFUS, R.N., Superintendent

IN December of 1934 the San Luis Obispo County Tuberculosis Sanatorium was established in Los Berros Valley.

In 1937 Federal W. P. A. and county funds were appropriated by the County Board of Supervisors and the present Sanatorium was erected.

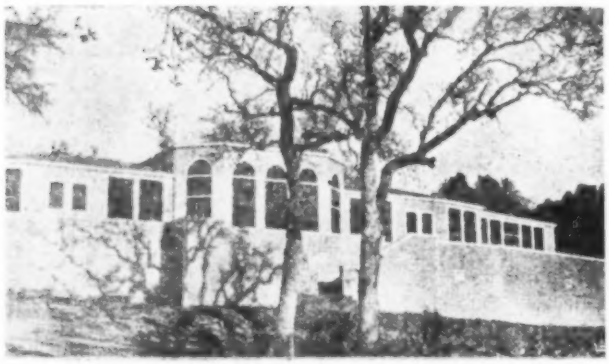
The Sanatorium, of early California Mission design, was built to care for forty patients, in wards, and in private and semi-private rooms. The institution is equipped to do x-ray and fluoroscopic examinations, pneumothorax and minor surgery. For major surgery the patients have entree to the San Luis Obispo County General Hospital. The nurses and nurses' aids are especially trained in caring for the tuberculous.

A program has just been approved for landscaping the surrounding grounds with beautiful trees and shrubs.

Esther Rosencrantz, M.D., of San Francisco, is the Medical Director and also has charge of the contact and out-patient clinic. William L. Rogers, M.D., of San Francisco, has recently been appointed chest surgeon. The follow-up clinic is conducted by the Superintendent.

The Sanatorium is owned and operated by San Luis Obispo County and is subsidized by the State of California.

California Sanatoria



ONE WING OF SANATORIUM

AHWAHNEE SANATORIUM

AHWAHNEE, CALIFORNIA

AHWAHNEE Sanatorium, the sanatorium of Madera, Merced and Stanislaus Counties was opened September 29, 1920, for all stages of pulmonary and surgical tuberculosis. It is situated in the beautiful Sierra Nevada mountains, and it is reached by a rugged road from Madera. There are 118 beds including a childrens department. Dr. Robert V. Baker is the medical superintendent.

BIRDSEYE VIEW OF HOSPITAL

HUMBOLDT COUNTY SANATORIUM

EUREKA, CALIFORNIA

THE sanatorium was established in 1922 for all stages of pulmonary tuberculosis. Children are admitted in separate cabins. The sanatorium has a capacity of 65 and it is limited to residents of Humboldt County. Dr. Allen R. Watson is the medical director.

TUBERCULOSIS PAVILION

SAN BERNARDINO COUNTY TUBERCULOSIS SANATORIUM

SAN BERNARDINO, CALIFORNIA

THE sanatorium occupies a one story building of the pavilion type and is equipped to take care of 84 patients.

Dr. E. W. Hayes of Monrovia has complete charge of both the hospital and clinic cases. Dr. Norman Abbott of Ontario is the senior attending physician and Dr. Ben D. A. Miano of San Bernardino is the junior attending physician. Dr. V. M. Pinkley is the superintendent.

About sixty per cent of the patients are now receiving pneumothorax.

MONTEREY SANATORIUM

MONTEREY, CALIFORNIA

THE Monterey Sanatorium is a recent addition to the California county tuberculosis institutions. It was recently erected near the Monterey County Hospital in Salinas, California, and is equipped to care for patients with pulmonary tuberculosis in a modern manner. Dr. John C. Sharp, County Health Officer, is superintendent and medical director.

Vol. IV. June, 1938 No. 6

DISEASES OF THE CHEST

PACIFIC COAST STATES ISSUE
» » « «
OREGON SECTION

EDITORIAL COMMITTEE:

Ralph C. Matson, M.D., Portland, Chairman;
G. C. Bellinger, M.D., Salem; and James M. Odell, The Dalles.

FOREWORD:

THE Oregon Tuberculosis Association wishes to make grateful acknowledgement for this opportunity of presenting in this special Northwest issue of *Diseases of the Chest* the strides made in this section through the splendid cooperation of the members of the Committee of the Oregon Section.

The principal objective of the Oregon Tuberculosis Association since its inception in 1915, has been to build up machinery to provide for the care and control of tuberculosis, fostering legislation to increase the bed capacity in the state institutions and to provide adequate public health nursing. Their intensive campaign has resulted in providing 40 beds at the Tuberculosis Pavilion in Troutdale, Oregon, 325 beds at Salem, Oregon and 150 beds at The Dalles, Oregon. The latter institution is soon to open another unit of 50 beds. Selected surgical cases at these institutions are transferred to the Portland Open Air Sanatorium and the Multnomah Hospital, where pneumolyses and chest surgery is performed free of charge; the cost of hospitalization at the former institution being provided by the State Board of Control.

Thus far, 30,000 tuberculin tests have been conducted among school children, teachers and adults coming to the clinic of the University of Oregon Medical School, which, as part of the Out-Patient Department, has a well organized tuberculosis clinic conducted under the supervision of Drs. Matson and Bisaillon.

Oregon Sanatoria

MULTNOMAH COUNTY TUBERCULOSIS PAVILION

The Multnomah County Tuberculosis Pavilion was established in 1913 for the care of all stages of tuberculosis in any form through the efforts of the Oregon Tuberculosis Association.

The pavilion was built to care for thirty-seven patients and admittance to the hospital is limited to the residents of Portland and Multnomah County.

The hospital is located at Troutdale, Oregon.

VETERANS ADMINISTRATION HOSPITAL

The Veterans Administration Hospital at Portland, Oregon; is a general hospital with facilities for the care of thirty-two tuberculous patients in a separate ward.

It is administered by the Veterans Administration Facility and admittance to the hospital is open to all veterans of any war, who are able to show an honorable discharge.

Application for admittance should be made to the Regional Office, Veterans Administration.

TUBERCULOSIS PIONEER WHOM WE COMMEMORATE

RAY W. MATSON, M.D.

1880 - 1934

DR. RAY W. MATSON was graduated from the University of Oregon Medical School in 1902, along with his brother, Dr. Ralph C. Matson, with whom his life was closely interwoven during the entire course of his medical career. From the very first he developed an absorbing interest in everything that pertained to medicine which was exemplified by a versatility that is very occasionally encountered in the realm of medicine.

After serving an active apprenticeship for three years as an interne in the Good Samaritan Hospital, he continued in his endeavors to learn more of the fundamentals of medicine by becoming engrossed in every phase of histopathology, and as an apprentice, who later becomes a finished artisan, he early mastered every technic in pathology from the performance of a complete autopsy to the cutting, staining and identification of the tissues himself, in the days before the advent of modern technical short-cuts. In fact, it might be said that the microtome and microscope somewhat symbolized his whole medical life and thought. Undoubtedly, this capacity to explore minute details and to thoroughly do little things well with his hands was an important factor in endowing him with the great ability he developed as a teacher in pathology and in medicine, and providing him with his broad viewpoint as a consultant, as a diagnostician and as a practitioner of his art. If the case presented obscure manifestations he obtained scrapings from tissue, preparing them himself, and demonstrated to the consternation of the entire Pacific Coast that it was leprosy. If a lesion on the lip confused him, he did a biopsy and cured the cancer himself with an old Kinraide coil—the precurser of present day deep therapy machines. If a sputum or exudate needed classification, he made his own culture media and "planted" it all over the laboratory and would then inject any number of guinea pigs himself and then section the tissues, usurping the whole laboratory with staining dishes all about until he found the actual causative organism which was the trouble producer. His doggedness and determination in exploring the minutiae and details of any medical problem was one of his most outstanding medical traits.

Long before the present day concept, as recognized and acknowledged by internists and psychiatrists, of the role that is played by maladjustment in the production of fatigue, he delved into every phase of the patient's symptoms and reached the conclusion, which is still on hundreds of his case histories, that the patient was suffering from a "fatigue neurosis"—as is attested by the fact that large numbers of them are still suffering from the same complaints. Likewise, early in his career, in dealing with low grade fever, which persisted for months and years, he recorded on many of his case histories that patients were experiencing this slight elevation of temperature as a result of emotional maladjustments, which later years have proven to be correct.

In the early phases of pneumothorax work, indications and contra-indications for treatment were largely influenced by the status of the contralateral lung. During the time he was making a critical analysis of 600 pneumothorax cases, his attention was drawn to effects of pneumothorax on the evolution of the disease in the contralateral lung. With his characteristic thoroughness he examined the serial plates of each case and after making a classification of disease in the opposite lung, he published his conclusions in a paper "Observations in the Contralateral Lung in Pulmonary Tuberculosis," which was a precurser to much of the medical thought which followed. His contributions on oleothorax, phrenicotomy and thoracoplasty procedures still remain classics.

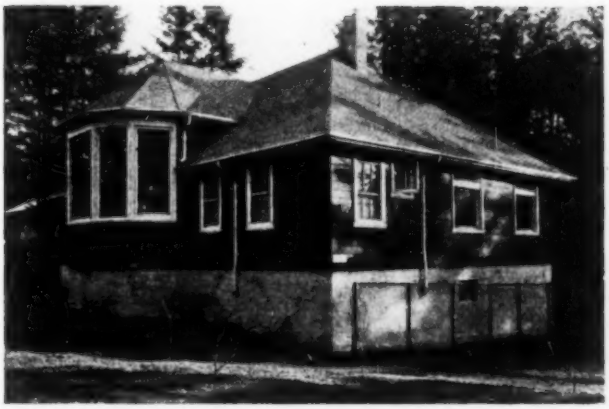
He was essentially a pioneer in all of his medical thought and endeavors, as is well shown in his voluminous writings on diseases of the chest, on which subject he became an international authority and for which he was accorded many honors and recognition both at home and abroad. He had a wide acquaintanceship abroad as a result of many years of study with many of the great masters of medicine in Europe.

On the United States' entrance to the World War, Dr. Matson was Chief of the Tuberculosis Examining Board, Vancouver Barracks, 1917–

Oregon Sanatoria

PORTLAND OPEN AIR SANATORIUM

MILWAUKIE, OREGON



The "A. L. Mills Surgery"

AN open air institution for treating pulmonary tuberculosis was one of the first attainments of the newly founded State Board of Health in 1903. Climate has been greatly over-played in recommending certain regions of the country as more suitable than others for tuberculosis patients. But few had considered the value of a climate such as that of Western Oregon which is neither inconsistently cold nor extremely hot, and where, despite alternate rains, life in the open air is possible the year round without sacrifice of comfort.

Accordingly, philanthropic minded citizens of Portland contributed the initial funds for purchasing 14 acres of ground on Milwaukie Heights, overlooking the Willamette River. On this site, seven miles from Portland, was erected an administration building and a few tent houses, and patients were admitted for treatment on January 8, 1905. It was the first open air sanatorium for the tuberculous in the Northwest. In July, 1905, the Portland Open Air Sanatorium was incorporated under the charitable laws of the State of Oregon. The results of these small beginnings were so encouraging that the conception of Oregon's climate being inordinately damp was quickly dispelled. Henceforth, the board of managers labored persistently to further the exceptional cause.

Cottage "A" was donated by the Brooks family, and "B" by the Corbett family. Mr. Whidden, a former member of the board, donated and planted the original shrubbery. The "nurses" cottage was built and equipped by the Oregon State Nurses Association with the understanding that members would be taken care of at the minimum sanatorium rate. The "Meier" cottage was a gift of the late Jeannette Meier, and the "Isam White Memorial" of Mrs. Isam White. The "D. C. Lewis" was built in memory of David C. Lewis by his sisters, Mrs. A. L. Mills and Miss Sally Lewis. The "Kermiss" cottages, 1, 2 and 3, were erected from the proceeds of a German Festival given in Portland for charitable purposes "Kermiss" cottage 4, was a gift from Ben Selling.

Dr. E. A. Pierce was appointed Medical Director in 1905, which position he held until August, 1912. During his service many new cottages were built, a modern sewage plant installed, a pavilion for open air amusement and exercise in stormy weather was constructed, and quarters for fifty patients were erected.

Oregon was given a diploma signed by President Theodore Roosevelt for outstanding work done in the movement to control tuberculosis.

The Sanatorium is controlled by a Board of Directors. A. L. Mills of the First National Bank of Portland was the President of the Board until the time of his death. He was followed by the Honorable Henry L. Corbett and later, on January 3, 1936, by Mr. Cameron Squires, who holds that position at the present time. Dr. Ralph C. Matson and Dr. Ray W. Matson became the Medical Directors in 1912, and in 1916, Dr. Marr Bisaillon, their associate, was added to the staff. Other members of the Board of Directors are composed of prominent Portland citizens.

The surgery of the Portland Open Air Sanatorium was built in 1926 by funds loaned by Mr. A. L. Mills of Portland, Oregon. This loan was repaid in full by charges received for the use of the surgery. It was named the "A. L. Mills Surgery" in honor of Mr. Mills.

The first phrenicotomies performed outside of Germany were done in 1914 at the Portland Open Air Sanatorium. Some of the earliest work in artificial pneumothorax in this country, as well as the first work on oleothorax and pioneering work on intrapleural pneumolysis and other types of chest surgery began at the Portland Open Air Sanatorium.

The surgery was planned and furnished in keeping with the most modern methods for the sole purpose of chest surgery. In addition to the main surgery there is also a dark surgery fully equipped for performing pneumolyses and other intra-thoracic operations. The building is furnished with a complete x-ray unit, as well as various types of apparatus for heliotherapy.

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later, from September, 1917 to June, 1918, he served in the same capacity at Camp Lewis, Washington. On April 23, 1918, he was appointed Major, Medical Section, Reserve Corps, U. S. Army. From June 19 to September 1, 1918, he was Divisional Tuberculosis Specialist, 91st Division. From September 1 to December 12, 1918, he served as Divisional Medical Gas Officer, 91st Division. The battles in which he participated were: St. Michiel, France; Meuse-Argonne, France and Ypres-Lys, Belgium. During the tenure of his service as head of the Tuberculosis Examining Board at Camp Lewis, he formulated a system for the examination of recruits which was later adopted by the United States War Department.

At the close of the war, he was honorably discharged, Major, Medical Corps, U. S. Army, 1919. Later, he was appointed Lieutenant Colonel, Medical Reserve Corps, which title he held at the time of his death.

His influence is still felt by many hundreds of his medical students and many of his medical ideas still persist in the minds of his contemporaries who were his colleagues.

In his personal life, all those with whom he came in contact were impressed with the richness and warmth of his personality.

If one were to endeavor to characterize his whole medical life in an epitome of a few words, one could well say of Ray W. Matson—"He was a good doctor." —M. B.

Oregon Sanatoria

EASTERN OREGON STATE Tuberculosis Hospital

THE DALLES, OREGON

J. M. Odell, M.D., Supt.

THE Eastern Oregon Tuberculosis Hospital, when buildings now under construction are completed, will consist of the main hospital building of three wings, hospital annex, pavilion, heating plant and laundry, nurses' home, superintendent's and resident physician's residences. These buildings are on a plateau five hundred feet above the City of The Dalles and overlooking it and the Columbia River.

Eastern Oregon was without a tuberculosis sanatorium until the present one was opened in 1929. At that time the main hospital building accommodating ninety patients and the superintendent's residence were completed. In 1932, a pavilion adequate to care for forty additional patients was completed. New buildings comprise a central heating plant and laundry, nurses' home which has quarters for thirty nurses, a physician's residence and a hospital annex of fifty beds. A preventorium for children when constructed will complete this unit. This additional building however depends on available funds. The value of the buildings is approximately $3[illegible],000.

This institution is operated by the State of Oregon, being under the direct supervision of the State Board of Control which is made up of the Governor, Secretary of State, and the State Treasurer.

Built primarily to care for patients from Eastern Oregon, many Western Oregon patients are admitted here due to an acute shortage of beds in that area, which comprises all the counties west of the Cascade Mountains and also has the major portion of the population.

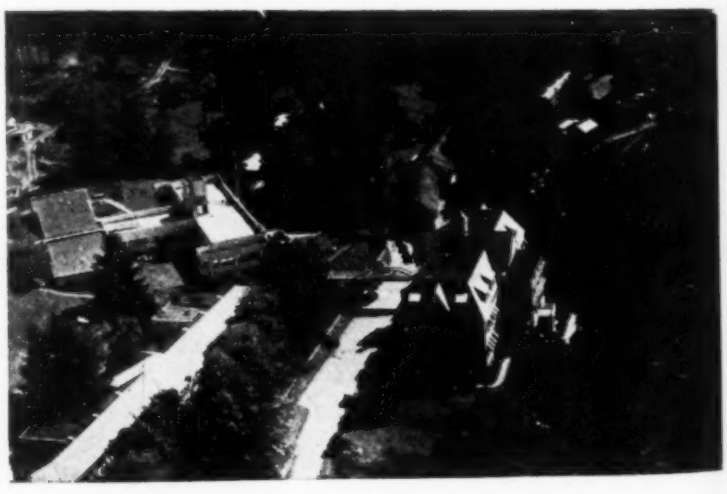
The Dalles being west of the Cascade Mountains has a maximum of sunshine and clear weather which helps materially in raising the morale of patients.

OREGON STATE TUBERCULOSIS SANATORIUM

SALEM, OREGON

G. C. Bellinger, M.D.

Superintendent



THE Sanatorium was established by an act of the Legislature in 1909 and was opened November 21, 1910. It has grown from a 60 bed open air sanatorium into a modern 325 bed institution equipped for the treatment of tuberculosis. It is located six miles southeast of Salem on a 149 acre site in the timbered foothills. The hospital is the central unit surrounded by four open air pavilions. There are three residences for physicians, a three story brick building for graduate nurses, a four story brick building for administrative purposes, and a heating plant and laundry. The institution maintains a herd of sixty Guernsey cattle for its milk supply.

Pneumothorax treatments were first given in 1914. A large out-patient service is carried on. Ex-patients return for pneumothorax at definite periods. X-rays, laboratory routine, and physical examinations are done every six months. Tuberculin is furnished private physicians and Health Departments for skin testing, and clinics for checking contacts are held frequently.

Total Removal of the Right Lung for Bronchogenic Carcinoma*

RALPH C. MATSON, M.D., F.A.C.P., F.A.C.S.;
JOSEPH M. ROBERTS, M.D.; AND MARR BISAILLON, M.D., F.A.C.P.
Portland, Oregon

BY successfully removing a carcinomatous left lung and thus saving the life of their patient, Evarts A. Graham and J. J. Singer[1] in 1933 gave dramatic impetus to an operative procedure indicated by Nissen[2] of Berlin in 1931, and regarded by surgeons today as a probable means of recovery for many patients suffering from bronchogenic carcinoma.

The facts related to the frequency, pathogenesis and diagnosis of bronchogenic carcinoma bear a brief restatement. The disease has been variously reported as occurring in from 5 to 10 per cent of all cases of carcinomata[3]. Early diagnosis is possible in the great majority of cases because of the tendency to produce cough and blood-streaked sputum in middle-aged non-tuberculous individuals, who, on roentgenological examination, show an atelectatic process distal to the obstructed bronchus. In fully 70 to 80 per cent[3] of this group, sections of the growth for histopathological examination can be taken through the bronchoscope and a clinical and roentgenological diagnosis will be confirmed. In the case to be presented, after negative findings by bronchoscopy, a much-neglected diagnostic procedure, namely, thoracoscopy, was resorted to, following the establishment of a diagnostic pneumothorax, and a positive diagnosis at that time was later confirmed by study of the removed lung.

Owing to the failure to obtain satisfactory results in the treatment of carcinoma of the lung by the use of radium and the x-ray, the resort to surgery was logical and the results have proved encouraging. Since the first successful pneumonectomy in 1933, for carcinoma of the lung, there have been numerous attempts, with a fair percentage of successes. Our search through the literature brings the total of such efforts to 47. (Kummell-one, Meyer-one, Archibald-two, Ivanissevich and Ferrari-one, Lilienthal-one[4], Graham-four[3], Rienhoff-twenty[9], Freedlander-one[4], Alexander-one[4], Overholt-ten[4], Haight-one[4], Flick-one[8], Lyle-one[7], Edwards-two[10], Matson, Roberts and Bisaillon-one. Of these, upwards of twenty-eight are still living. The literature on this subject brought up to date in 1934 by Cameron Haight[5] and later summarized by Archibald[6], has been well covered by Graham[3], Lyle[7], Flick and Gibbons[8], Rienhoff[9], Walker[4], and Overholt[11].

The particular objective of this paper is to call attention to the value of thoracoscopy as a diagnostic procedure where carcinoma of the lung is suspected and bronchoscopic findings are negative. No other method can yield so much authentic foregoing knowledge as direct visualization of the growth and its relationship to surrounding structures. Furthermore, because of the comparatively few total pneumonectomies performed for carcinoma, it would seem desirable to report not only the successful ones but also those which were unsuccessful, if the cause of failure is known, as in the case to be reported.

Report of Case

J. S., aged 46 years, Servian, who had been employed in copper mines since 1917, was first seen in the Out-Patient Clinic of the Medical Department of the University of Oregon Medical School on October 15, 1935, complaining of a productive cough of two years' duration, and a dull precordial pain. Roentgenological examination revealed a consolidation of the upper lobe of the right lung; it was reported as "probably carcinomatous." The patient was advised to enter the Multnomah Hospital for further study but he refused. However, he returned for bronchoscopic examination on October 21, 1935, which was unsatisfactory because the instrument could not be brought into proper position to obtain a specimen for biopsy, only normal tissue being seen. On the 22nd of October, 1935, a diagnostic pneumothorax was induced and maintained until December 4, when the patient consented to a thoraco-

* From the Department of Surgery, University of Oregon Medical School, Portland, Oregon.

scopic examination of the pleural cavity. Nodules were seen through the visceral pleura which presented a typical gross appearance of a carcinoma. Although specimens were taken for histopathological study, they were reported negative as the section was taken by an older type of forceps and was of insufficient size to permit thorough study, revealing only a chronic pleuritis of the visceral pleura. It is very evident that the "bite" did not penetrate beyond the visceral pleura.

The physical findings pertinent to this report were entirely within the thorax. Prior to the establishment of the pneumothorax, there was dullness to percussion over the upper lobe of the right lung, with diminished breath tones. The temperature averaged 100.6°F. in the afternoon and the pulse ranged an average of 94. Respirations were 22 per minute.

Following the thoracoscopic diagnosis of carcinoma of the lung, surgical removal of the lung was proposed. The patient, however, refused operation and left the hospital December 11, 1935. He reentered February 19, 1936 because of aggravation of his symptoms. The sputum, in the meantime, had increased to 200 cc. in twenty-four hours, with occasional hemoptysis. The roentgenological examination showed a marked extension of the growth with necrosis. The diagnostic pneumothorax was reestablished. Total removal of the right lung was again proposed and performed on March 5, 1936.

Laboratory reports: March 2, 1936: Hemoglobin 81.8 per cent—11.29 grams; R.B.C. 3,390,000; Color Index .97; W.B.C. 8,200; Polymorph. Leucocytes 63 per cent; Polymorph. Eosinophiles 5 per cent; Polymorph. Basophiles 1 per cent; Small lymphocytes 21; Monocytes 6 per cent; Staff cells 4 per cent; Sedimentation rate 81 mm. per 15 minutes, 104 mm. per 45 minutes; Blood urea 14.2. Both blood Kilmer and Kahn tests were negative. These had previously been positive. The patient had had two years of anti-syphilitic treatment. Kidney function tests were normal. Urine was negative.

Sputum

Amount varied from 45 cc. to 210 cc. Yellow—mucoid. Repeatedly negative for tubercle bacilli. Contained many short chained streptococci. Settled into three layers.

Operation

70 mgm. of Tri-bromethanol per kilogram of body weight were given as a basal anesthetic 30 minutes before the patient was taken to the surgery. Because the electro-surgical technic was decided upon, nitrous oxide and oxygen were used to supplement the narcosis. An incision was made in the 5th intercostal space through the intervening muscle layers and extended from the posterior axillary line to the sternal border on the right side, then parasternally to the 1st rib through the pectoralis major. The 5th to the 2nd ribs inclusive were severed at their costochondral junctions together with the intercostal muscles. This chest wall flap was then retracted upwards, giving an adequate exposure of the pleural cavity. The middle lobe of the lung was found to be adherent to the pericardium and the upper lobe to the pleural cupola, subclavian vein and superior vena cava. These adhesions were severed with the high-frequency current (Bovie Unit). Posteriorly, there were extensive adhesions in the costovertebral gutter, and, inferiorly, dense adhesions were present between the base of the lung and the diaphragm—all of which were severed with the electrode. In spite of profuse bleeding it was controlled by electrocoagulation. The pulmonary ligament was then severed from the diaphragm to a point just below the inferior pulmonary vein, and the phrenic nerve isolated and cut anterior to the hilus. Because of massive infiltration of the lung close to the hilus only one snare could be placed in position. The lung was then severed about 2.5 cm. from the bifurcation of the trachea. While the hilus was severed as close as possible to the snare, carcinomatous tissue still remained in the hilus stump. This was cut out with a loop electrode, leaving a crater-like stump, and because of fear that the snare might slip off, it was found possible to place a No. 3 chromic gut ligature still closer to the mediastinum to prevent hemorrhage in case the snare lost its grip. The pulmonary artery and veins were then isolated and tied with No. 12 braided silk. Because of the short bronchus stump preventing a better form of closure, it was cauterized with phenol which was neutralized

with alcohol. The walls were then brought together with interrupted waxed black silk sutures. The entire stump was closed with interrupted chromic gut sutures. The snare was then slowly released. No bleeding took place. Because of the necrotic type of lesion and the fact that there was so much invasion of the hilus that the stump could not be well covered with tissue and a bronchus leak was anticipated, a Pezzar catheter was placed in the mid-axillary line two intercostal spaces above the level of the diaphragm to allow for its probable elevation. The ribs were approximated with chromic catgut and the intercostals, as well as other muscle layers, brought together with catgut, the skin being closed with dermal.

Although the patient stood the operative procedure well, 450 cc. of citrated blood were given intravenously during closure of the chest wall. He was returned to his room in good condition but was immediately placed in an oxygen tent. His blood pressure remained between 90 and 110 systolic, and 60 and 70 diastolic, with a pulse ranging between 70 and 120 during the first postoperative week. Intravenous glucose was administered daily. On the third postoperative day an x-ray film revealed no evidence of fluid in the pleural cavity. On the seventh day, however, roentgenological examination revealed fluid in the right pleural cavity, with improper drainage. The Pezzar catheter which had been placed for drainage at the time of operation, was obstructed by the rising diaphragm. Because of elevation of temperature and evidence of empyema, drainage tubes were placed, on this date, in the 2nd interspace in the anterior axillary line and in the 6th interspace, in the mid-axillary line, for through-and-through irrigation with Azochloramid. At this time 1500 cc. of seropurulent fluid were removed from the pleural cavity. Daily aspirations totalled from 150 to 500 cc. Complete drainage was obtained on the ninth postoperative day and the patient's subsequent course was uneventful. The patient's general condition was so good that special nurses were dismissed and because of urgent need of hospital beds the patient, who had occupied a two-bed ward alone, was moved into a six-bed medical ward, where shortly afterwards a number of pneumonias developed. Our patient contracted an acute respiratory infection accompanied by severe coughing, which was no doubt responsible for the development of the small bronchial fistula which was recognized on the 17th day, but caused no great embarrassment to the patient. He expired suddenly on the twenty-sixth postoperative day, at the time when considered well on the way to recovery.

Pathological report: Well differentiated squamous cell bronchogenic carcinoma of the so-called hilar nodular type.

Autopsy report: Death was due to an acute massive hemorrhage from an erosion of the superior pulmonary vein just below the bronchopleural fistula, the small opening in the right main bronchus being just above the erosion on the superior pulmonary vein. There were no metastases.

Comment: A case of bronchogenic carcinoma of the right lung is reported which presented certain interesting features. Cancer of the lung, if early diagnosed and surgically treated, carries a more hopeful prognosis than if therapy is delayed, as in this case, due to the patient's refusal of operation in December, 1935. At that time the growth was comparatively small and the lung, as viewed through the thoracoscope, was adherent to the chest wall by rather insignificant band adhesions. In spite of negative bronchoscopic findings the thoracoscopic examination revealed a typical carcinoma, which was confirmed later at operation. At the time of the thoracoscopic examination, total pneumonectomy would have been relatively simple and there would have been little time wasted in mobilizing the lung. Furthermore, there would have been ample uninvaded tissue in the hilus to sever the bronchus transversally and affect a better closure than was possible because of its having been cut vertically, which involved greater difficulty of secure closure. Moreover, at the time the patient returned for operation, because of marked increase in constitutional disturbance, the primary pneumothorax had been partially obliterated and dense adhesions had formed between the parietal and visceral layers of the pleura—thus prolonging the operation. The distribution of the tumor made it necessary to sever the bronchus close to the bifurcation of the trachea. We were unable to bury the stump because of the massive character of the neoplasm

which provided insufficient mediastinal pleura. Nevertheless, the exact position and nature of the tumor and its adhesions were determined by direct vision through the thoracoscope preoperatively, at which time total right pneumonectomy would have offered a more definite outlook for recovery. In spite of the technical difficulties encountered in this case and successfully overcome, it is felt that the violent coughing during the acute respiratory infection opened the bronchus, which caused the erosion on the superior pulmonary vein, resulting in fatal hemorrhage twenty-six days after operation.

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Secondary Intestinal Tuberculosis

GROVER C. BELLINGER, M.D.
Salem, Oregon

THIS paper is devoted entirely to secondary and usually ulcerative intestinal tuberculosis as a complication of pulmonary tuberculosis. It has been denied by some that primary tuberculosis of the intestine occurs. However, it seems safe to say that some 15 per cent of frank clinical cases of intestinal tuberculosis are primary, but that these primary cases present themselves with a much different onset and clinical picture, so that they may be missing entirely in a fairly large group which reports to chest clinics or institutions for the care and treatment of tuberculosis.

Intestinal tuberculosis has long been recognized as a most important complication of pulmonary tuberculosis. Autopsy figures from many sources have shown that tuberculous involvement of the intestines occurs in 75 per cent or more of pulmonary cases by the time death occurs. In clinical cases its occurrence varies with several factors which may be present. This will be discussed later on in this paper. Suffice it to say here that, roughly speaking, it is apt to be present in from 15 to 20 per cent of the cases of frank pulmonary tuberculosis as they present themselves to the physician. Its importance in the clinical management of pulmonary tuberculosis is, therefore, very great and the condition should be constantly kept in mind.

Following earlier observations made by Stierlin especially, Brown and Sampson published their work in 1919 which brought the management of this condition into an orderly plan of diagnosis and treatment. In 1926 the first edition of their monograph on Intestinal Tuberculosis was published. This outlined the history, pathology, symptomatology, diagnosis and treatment, and contained 590 references on the subject. In 1930, the second edition of similar scope with 783 references was published.

During the last twelve years, not less than 72 per cent of the frank cases of pulmonary tuberculosis admitted to the Oregon State Tuberculosis Hospital have been studied by the diagnostic methods recommended by Brown and Sampson. The following is the procedure used: Fluoroscopic examinations are made and films taken at four periods during the passage of the barium meal through the intestinal tract. The meal substantially as recommended by Brown and Sampson has been followed. This consists of 4 ounces of barium sulphate mixed with a little water, then milk added to make 14 ozs. A little malt may be used for flavoring. This mixture is rather pleasant in flavor, but the bulk as well as the more or less powdery

taste is not especially relished. However, no serious difficulty arises in giving it. Laxatives are avoided the previous 15 hours, and the meal is given on an empty stomach at 7:00 a. m. so that the observations will fall at 2:00, 3:00, and 4:00 o'clock in the afternoon and the 24 or 25 hour observation will fall at a convenient time the next morning. Various modifications of the technique have been tried from time to time. In frankly negative cases, some modification might be sufficient and allow saving of time and expense. However, the best we were able to do seemed so much worthwhile and a uniform series of records helped us so much in checking back in certain cases, that we have held to the technique of examination above referred to with the feeling that we are obtaining values from it which we have not been able to work out otherwise. Barium enemas have been tried from time to time. We have found them of value, but only as a supplementary procedure.

We fully recognize that the findings of the barium meal are not specific in tuberculous entero colitis. On the other hand, in a service of this kind, where frank pulmonary tuberculosis is kept under regular resident observation and frequently checked by a rather intensive clinical program, the procedure will diagnose the condition with a high degree of accuracy.

For statistical study in this paper, the years 1924 to 1936 inclusive have been used. The percentage of pulmonary cases diagnosed by this method as having a positive intestinal involvement has ranged from 31 to 12 of those studied, it being lower in the more recent years. It is of interest to note that during this 12 year period the per cent of pulmonary cases discharged as improved, quiescent, arrested has increased from 43 per cent in 1912 to 69 per cent in 1936 with an institutional death rate dropping correspondingly from 36 per cent in 1912 to 19 per cent in 1936. Credit for part of this we feel goes to the early diagnosing and treating of the cases who develop the intestinal complication.

As is to be expected, the highest per cent of positive intestinal cases occurs in the cases with the far advanced type of pulmonary disease. Our records show that 75 per cent of the positive intestinal cases were far advanced, 20.6 per cent were moderately advanced, and 4.4 per cent were minimal cases.

Another point of interest to note is the ratio of the positive readings to the number of cases with pulmonary cavities present. Eighty-two per cent of the intestinal positives had such cavities, a little over 10 per cent did not have cavities. In reading cavities, we have been inclined to read cavitation present when rarefied areas were present in a fairly dense infiltration, even though such rarefications were not sharply defined as cavities. We have been led to this position by the frequency with which clearly defined cavities can be seen in such infiltrations after pneumothorax has been started.

As to the sputum findings in the cases studied, over 95 per cent had a positive sputum. In testing sputum, we not only use the concentration method of antiformin in all cases negative by the routine methods, but we also collect seven day specimens in 5 per cent phenol when tubercle bacilli are not found by the cold stain slide method.

The following table is an analysis of symptoms referable to the abdomen in 172 consecutive and unselected cases which were read positive and doubtful in our barium meal studies. The doubtful readings might have been left out of this table as they do not constitute over 10 per cent of the total and would not, therefore, seriously effect the general picture which this table gives. Under this heading, too, I wish to report that our work confirms the value of being especially on guard as to intestinal tuberculosis in cases which do not do well even though their chest condition suggests that they should. In discussing symptoms, I wish to call your attention to the fact that our study supports the point that a very substantial number of cases of intestinal tuberculosis do not complain of symptoms which are liable to attract the attention of the physician at the time that the diagnosis can be made by barium meal. This fact has been called to the attention of the profession so often that I think we can no longer question that the barium meal allows the roentgen ray to point out tuberculosis of clinical importance in the intestinal tract long before it would express itself by symptoms, just as the same agent may do in the chest.

Symptoms in 172 Positive and Doubtful Cases Unselected

	No. Cases	Per Cent
Loss of Appetite	37	21.4
Soreness	11	6.4
Cramps	8	4.6
Indigestion	40	23.
Discomfort	7	4.
Diarrhea	11	6.4
Constipation	30	29.
No symptoms	75	43.6

12 per cent had constipation as the only symptom (Digestive).

7 per cent had loss of appetite as the only symptom (Digestive).

The physician in general practice who finds the rather complicated and time consuming barium meal procedure impractical, may resort to the barium meal enema using 8 ounces of barium sulphate mixed in 1½ quarts of warm water. Our impression is, however, that a negative enema reading might be misleading, though a distinctly positive reading is quite helpful. Until such time as the barium diagnostic procedure can be carried out, the physician should be on his guard against this complication which occurs in such a substantial number of his cases of pulmonary tuberculosis. He should become suspicious and treat expectantly any case that does not do as well as he feels it should from his observations of the chest conditions. He should be especially suspicious when sputum positive disease has been present for some time. If regular sputum examinations are not available, he may consider that sputum would be more or less continuously positive when frank cavity or well established disease is accompanied by chronic cough and expectoration of muco purulent sputum.

Treatment

I think we should keep in mind the good general management of our tuberculosis cases, the special hygiene that will have them dispose of their sputum with the least possible contamination of their throat, mouth, and the intestinal tract, as well as other tracts adjacent to the throat and mouth region, and the advantage of closing lung cavities and rendering sputum negative as early in the course of disease as possible. We have used ultra violet energy and special diet since 1923 when we first instituted the program of control of intestinal tuberculosis as recommended by Brown and Sampson.

Ultra-Violet

The Ultra-Violet is supplied by mercury quartz burners supplemented by natural sun in the morning or evening hours of the summer time in suitable cases. The plan of gradually increasing the time and area in Ultra-Violet exposure has been followed from the start. Treatments are given daily except in tapering off what seems to be a successful course. We have worked under the principle of thoroughly exposing the skin area to mild exposures, or more intensive exposures, if well borne. In the earlier years, carbon arc lamps of various types were used to some extent and apparently good results were secured. However, mechanical objections of various kinds caused us to discard carbon arc lamps so that mercury quartz burners have been used almost exclusively during the past seven years in the mechanical generation of Ultra-Violet energy.

I believe Ultra-Violet has been the most fundamentally valuable form of treatment in our work with intestinal tuberculosis. We have made it a practice to protect the eyes and head region. The chest has been protected to varying degrees according to the judgment of the various physicians. It is my personal belief that no one has proved Ultra-Violet to be especially injurious in the sense of causing new spread of disease or destructive changes in tuberculous lesions and that, if we keep in mind the principle of mild exposures which can be given with comfort to the patient, the chest area can be exposed much more than it has been in the past.

We have not used cold quartz generators but note that they have been accepted by some as an efficient source of ultra-violet energy. Any source of ultra-violet which gives the quality and quantity required is satisfactory. The reaction of the skin and the comfort of the individual patient should be used as a guide. Skin irritation should be avoided as much as possible. Those with very sensitive skins may be hardened in by air baths and the air baths may be supplemented by the weaker ultra-violet lamps often recommended as "health lamps," but these should not be depended upon for definite

treatment. On the other hand, intensive ultra-violet exposures crowded into the shortest possible space of time are neither necessary nor desirable. Rapid tanning should not be sought. Moderate doses will allow a gradual tanning without irritation or discomfort in those who respond especially well, and such doses should be our standard.

We have not tried Roentgen ray in treatment, though I feel we might have done better in some of our refractory cases had we done so.

Diet

The special diet used by us in intestinal tuberculosis has undergone considerable modification during the past 12 years. Brown and Sampson in the first edition of their book published in 1926, devoted one-half page to diet. The second edition issued four years later gave 5¼ pages to this phase of the subject. At first, we had in mind only a bland diet to avoid irritation of the diseased intestines. This diet was neither satisfactory to the patient nor sufficiently protective in vitamins, and perhaps did not contain sufficient protective minerals in cases which did not take pureed vegetables or milk well.

Very early we began allowing the use of some of the less fibrous vegetables and some of the fruit juices which were at first excluded. From the start we have excluded irritating spices, condiments, and foods containing hard and sharp particles such as corn and oat husks, bits of apple core, etc., etc. We feel that this should be routinely enforced. Our break over to a more generous diet has been rather rapid during the past five years. Tomato juice and rich Cod Liver Oil were added as a diet supplement soon after McConkey's work was reported.

The particular importance of vitamins "C" and "D" in intestinal tuberculosis was first brought out by the work of A. H. Grant published in 1926. This was further emphasized by the work of McConkey and Smith and especially by McConkey's report of treatment of intestinal tuberculosis with rich Cod Liver Oil and tomato juice which was published in 1929. In our own work we have found a plan based on the work of Grant, McConkey, et al essentially sound and we believe that the physician in general practice should see that the diet of his cases of tuberculosis and particularly those with possible intestinal involvement, includes an adequate supply of vitamins. More specifically he should see that the supply of vitamins "C" and "D" are adequate. Tuberculosis apparently absorbs vitamin "C" in direct proportion to clinical activity. At least the patient should have an adequate supply and this should be prescribed in the form of cevitamic acid tablets, if necessary.

Calcium intravenously was started in our service immediately after the publication of the work done at the Fitzsimmons Hospital in Denver, and calcium has been continued quite routinely in some form since that time. Most of the intravenous calcium is now given as 5 per cent chloride with 10 per cent dextrose in physiological saline solution and is our method of choice for abdominal discomfort and pain. Doses are spaced from once in seven days for routine to once daily in more extreme cases of painful ulceration. Under this plan of management diarrhea has not been a serious problem. We do have a few cases of protracted diarrhea which are entirely refractory to treatment. Some of these are apparently accompanied by amyloid disease. This point has not been scientifically checked in our service. Symptomatic medication, as usually recommended, has been used as necessary. Small doses of castor oil have been found useful in relieving intestinal soreness. Iodoform internally has been used occasionally in some cases.

The records of our present patients who have intestinal tuberculosis contrast sharply on the favorable side when compared with those with this complication before this form of management was put into use.

An invitation is extended to all physicians to attend
The Scientific Session of
The American College of Chest Physicians

California Biographies Continued

FRANCIS MARION POTTENGER, M.D.

(Continued from page 24)

published by C. V. Mosby Co., St. Louis: *"Muscle Spasm and Degeneration in Intrathoracic Inflammation and Light Touch Palpation,"* 1913; *"Tuberculin in Diagnosis and Treatment,"* 1913; *"Clinical Tuberculosis"* (2 vols.), 1917, 2nd edition, 1922; *"Symptoms of Visceral Disease,"* 1919, 2nd edition 1922, 3rd edition 1925, 4th edition 1930, 5th edition 1938; *"Tuberculosis and How to Combat It,"* 1921, 2nd edition 1928; *"Tuberculosis in the Child and the Adult,"* 1934. —E. B.

ROBERT A. PEERS, M.D.

(Continued from page 9)

parts of the west to carry on the work begun by Peers himself. The affectionate regard in which these men hold him is perhaps one of Dr. Peers' most cherished possessions.

Among the honors confirmed on Dr. Peers in the past may be mentioned: President, Placer County Medical Society; Secretary, Placer County Medical Society (Incumbent); President, California Northern District Medical Society; President, Placer County Tuberculosis Association; President, California Tuberculosis Association; Director, National Tuberculosis Association; President, California Academy of Medicine; President, California Medical Association.

Dr. Peers is at present a member of the Placer County Medical Society, California Medical Association, Fellow in the American Medical Association, Fellow in the American College of Physicians, California Academy of Medicine, member American Board of Internal Medicine, Fellow in the American College of Chest Physicians.

—S. J. S.

WALTER JARVIS BARLOW, M.D.

(Continued from page 11)

vent his active participation in a large number of movements for the civic betterment of his community. He was presented with two honorary degrees from his Alma Mater, Columbia University, Master of Arts in 1919 and Doctor of Science in 1929.

This short account of Dr. Barlow's activities and honors gives some idea of his professional attainments. With all his contacts with his fellow man, he exhibited a rare charm and magnetism which accompanied an unusual kindliness and interest in other people. —E. R. W.

MAX ROTHSCHILD, M.D.

(Continued from page 11)

beneficial effects were obtained.

He often detailed the discouraging criticism he brought down upon himself when—in 1909—before the County Medical Society, he detailed the possibility of administering medicinal agents intravenously. A medical patriarch present demanded the floor to "sound a note of warning" and advised against any such dangerous pro-

In 1914 he directed many experiments in the use of aniline dyes in the treatment of tuberculosis, as well as their use by direct injection into lung cavities through the chest wall.

His many contributions to medical literature included monographs relative to the early diagnosis of adult and childhood tuberculosis. Being a collaborator with Hanz Much and Deyke of Germany, he gained international recognition. At the time of his death he was preparing a paper to be delivered at an Eastern conference in September, which detailed his experiences with tuberculin over a period of thirty years.

His knowledge of music and the arts, combined with an incomparable personality, made him an outstanding figure in any assemblage. Over and above this, however, he will ever live in the hearts of all his friends for his generosity and innate kindliness. He was an eternal optimist and had the God-given ability of making every sick individual feel cheerful and bouyant after his bedside visit. Nor was this optimism assumed as a cloak for a bedside mannerism—his optimism permeated his whole personality.

A gracious host, he was known over the entire coast for his delightful hospitality, which made him beloved among his friends and colleagues. As "Max" he was known not only for his unusual professional ability, but also for his charitable services for the less fortunate persons who comprised a great percentage of his practice.

A patient contributes:

He is not dead, and this is not the end—
He leaves a living monument behind,
And deep within our hearts the years will find
The ever-smiling presence of a friend

—H. W.

WILLIAM H. BUCHER, M.D.

(Continued from page 12)

entitled "Surgeon Errand" in 1935. His services were recognized by his election as president of the Trudeau Society of Los Angeles in 1932, as vice president of the California Tuberculosis Association in 1934, and as president of the California Sanatorium Association in 1933.

With his death on December 30, 1934, the antituberculosis movement lost one of its most effective and far seeing executives, and thousands of patients lost a devoted friend. The Olive View Sanatorium in Los Angeles County, with its beautiful scenic setting, its thousand patient beds, its modern surgical pavilion, its extensive clinical and research laboratories, and its graduated system of care and rehabilitation, remains as a monument to his efforts. —E. B.

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DISEASES OF THE CHEST

PACIFIC COAST STATES ISSUE
» » « «
WASHINGTON SECTION

EDITORIAL COMMITTEE:

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Tuberculosis Pioneer

JOHN WEINZIRL, M.D.
1870 - 1935

JOHN WEINZIRL, professor of bacteriology and director of the McDermott Foundation at the University of Washington at the time of his death, June 26, 1935, was a native of Wisconsin. He was educated at River Falls Normal School and the University of Wisconsin (B.S. 1896, M.S. 1899, Ph.D. 1906). Deeply interested in public health, he won the degree of Dr. P.H. (1918), at Harvard while on sabbatical leave.

In the fall of 1896, while engaged in special studies at the University of Wisconsin in preparation for accepting an appointment as director of research at Agricultural Experiment Station, Geneva, New York, he was stricken with tuberculosis. This event changed the course of his life and gave direction to a substantial part of his future research work.

He went immediately to New Mexico, where he remained for nine years and completely regained his health. During this period he served as assistant professor of biology at the University of New Mexico (1897) and professor of biology and chemistry (1900), and as director of the Hadley Climatological Laboratory.

He was called to the University of Washington in 1907. The McDermott Foundation for tuberculosis research was created in 1924 and Professor Weinzirl was made director.

Professor Weinzirl's published scientific work comprised some forty-five titles, distributed about equally among three fields: (1) the pure science of bacteriology, (2) the applied field of sanitary bacteriology and public health, and (3) tuberculosis. Perhaps of chief interest in this latter field was his work on the desensitization of tuberculous guinea pigs to the toxic products of tubercle bacilli. —A. W.

FOREWORD:

THE Washington Tuberculosis Association takes this opportunity to congratulate the Editorial Committee of the Washington Section of this issue of *Diseases of the Chest* for a splendid portrayal of the sanatorium facilities for the treatment of tuberculosis in the State of Washington.

Since its organization in 1906, the Washington Tuberculosis Association has promoted a continuous campaign of education against tuberculosis, as well as secured legislation authorizing county commissioners, separately or by forming districts, to construct and maintain sanatoria and to employ public health nurses. There are now seven county and one municipal sanatoria with a total capacity of more than 900 beds.

Faced with the need for nurses trained for public service, the Association in 1918 sponsored a summer course in public health nursing at the University of Washington so successfully that in the fall the University made it an integral part of its curriculum.

Recognizing the vital importance of early diagnosis, in 1920 the Association developed an itinerant diagnostic chest clinic and consultant service with a full-time specialist in charge. Mantoux tests have been stressed especially in the high school and college age since 1931, over 13,000 tests being given in 1937. The splendid cooperation of physicians, public health officials, educators, and tuberculosis leagues has been an important factor in attaining this result.

During the life of the Association, the death rate from tuberculosis has decreased from 104 per 100,000 population to 46 per 100,000 in 1937, despite a rapidly increasing population.

Washington Sanatoria

FREDERICK SLYFIELD, M.D., and JOHN E. NELSON, M.D., Medical Directors

THE Laurel Beach Sanatorium, a private 75 bed institution for diseases of the chest is ideally located with a magnificient view of Puget Sound and the Olympic Mountains. The sanatorium was established in 1921 by the present medical directors, who are the proprietors of the institution. It is completely equipped with laboratory, x-ray, surgery, etc.; for diagnosis and for medical and surgical treatment.

All of the rooms are either private or semi-private, which affords the patient the greatest amount of comfort condusive to well-being. There are no wards. The rates including medical service and pneumothorax are $25.00, $30.00, and $35.00 per week.

RAYMOND TENNANT, M.D., Surgeon
KATHERINE STEWART, Med. Technologist

MURDINA MCDONALD, R.N., Superintendent
EDNA FERBERT, Dietician

RIVERTON SANATORIUM

SEATTLE, WASHINGTON

MRS. LOUISE W. HARRIS, R.N.,
Superintendent

THE sanatorium was established in 1908 by private endowment, the Riverton Sanatorium is operated on a non-profit basis. The founding of the institution was made possible by the generous donations of Miss Sarah W. and Miss Margaret L. Denny, members of a well-known pioneer family in Seattle. Since then additions to the endowment and maintenance funds have been made by many other individuals. The institution has been fortunate since the beginning in having on its Board of Trustees outstanding citizens who have given very generously of their time and wise counsel.

The Sanatorium is situated on forty-five acres of beautiful grounds on the wooded slope of Riverton Heights, three miles south of Seattle. At the present time it has facilities for the care of fifty patients in an infirmary and cottages. The Board of Trustees plan to erect a modern forty-bed infirmary within the near future.

The endowment makes it possible to give modern treatment and comfortable accommodations to the patients at very moderate rates. The sanatorium is operated on the "open plan" so that physicians may personally manage their own private patients. It has adequate x-ray and pneumothorax facilities. The present medical director is Dr. Byron F. Francis. There is also a resident physician.

Washington Sanatoria

Walter Henry Memorial or (Administration Bldg.)

FIRLAND SANATORIUM

6 miles North of Seattle

RICHMOND HIGHLANDS, WASHINGTON

DURING 1910, Horace C. Henry, a charitable citizen of the City of Seattle, donated a tract of 34 acres to the City of Seattle for a Tuberculosis Sanatorium. This is the present site of Firland Sanatorium. Mr. Henry, besides donating the land, gave generously of his money and time, so that Seattle could have a place to cope with Tuberculosis, which was making great inroads on its citizens.

Work proceeded on the erection of several cottages and the Sanatorium opened its doors on May 2nd, 1911, with 2 patients, a Superintendent and 1 Registered Nurse.

It has grown to a 250 bed capacity, and embraces several large structures like the above.

The Medical Director is Dr. Robert M. Stith, and Mrs. Edna L. Robinson is the Superintendent.

The plant is owned and operated by the City of Seattle, and accepts patients with one year, or more, city residence.

It maintains a high standard, consequently it ranks high in the number of arrested cases secured.

KING COUNTY TUBERCULOSIS HOSPITAL

W. W. SCHWABLAND, M.D.,
Superintendent

PHILIP H. NARODICK, M.D.,
Medical Director

KING County Tuberculosis Hospital was first established as a part of the King County Hospital System in 1901, being a tent hospital accommodating only the terminal cases.

Numerous additions have been built so that, at the present time, there are six units housing 165 beds. There is a separate section for administrative offices, x-ray, and laboratory departments, and a complete surgery. Pneumothorax, thoracoplasty, phrenic nerve operation, and intrapleural pneumolysis are done regularly.

An outpatient department is included as a part of the hospital service for case finding, diagnosing, treating, and rehabilitation.

The hospital is under the control of the King County Commissioners.

Washington Sanatoria

ALDERCREST SANATORIUM

SNOHOMISH, WASHINGTON

L. G. Woodford, M.D., Medical Director

ALDERCREST is a 57 bed sanatorium located on an ample elevated site eight miles east of Everett, Washington. It was opened on March 1st, 1918, through the efforts of the Tuberculosis league and with the financial aid and supervision of the County Commissioners.

The institution comprises a surgery, an isolation ward for nine children, and a workshop donated by the Everett Kiwanis Club. There is modern equipment throughout the sanatorium and it is conducted to produce the greatest good for the greatest number of county residents.

A competent staff administers adequate rest therapy, proper dietetics, collapse therapy when indicated, and educational treatment for pulmonary tuberculosis.

The staff is comprised of the following members: H. L. Eldridge, M.D., Physician; Oscar Proctor, M.D., Surgical Consultant; Miss Marie Sweet, R.N., Superintendent; and Miss Phyllis Plettle, Laboratory Technician.

EDGECLIFF SANATORIUM

SPOKANE, WASHINGTON

Frank S. Miller, M.D., Medical Director

THE Edgecliff Sanatorium, an institution for the treatment of tuberculosis, is owned and operated by Spokane County. It is located six miles east of Spokane, about two city blocks south of the Apple Way.

The Institution was opened for patients in the spring of 1915 and to date has its 3107th admission. All forms and stages of tuberculosis are accepted for treatment.

Starting with the Administration Building and Men's and Women's Wards, new buildings have been added as needed—Children's Building in 1917 and Infirmary in 1919. The Institution will now accommodate 140 patients. Its equipment is complete and up to date.

Any person who has a residence in Spokane County of one year is entitled to care at the Sanatorium regardless of financial condition. Patients from other counties in the state of Washington may be admitted when beds are available. Charges for patients amount to approximately $80.00 per month, this amount paying actual cost of treatment.

Patients seeking admission should apply to the Medical Director in care of the Sanatorium.

Washington Sanatoria

OAKHURST SANATORIUM

ELMA, WASHINGTON

Leslie P. Anderson, M.D., Medical Director

OAKHURST Sanatorium was first opened for patients in 1921, by authority of the Board of County Commissioners of Grays Harbor County. The first Board of Managers, appointed by the commissioners, were Dr. I. R. Watkins, Aberdeen; Mr. R. W. Craig, Hoquiam; and Mr. Eldridge Wheeler, Montesano. This board was re-appointed annually and served continuously, until the death of Mr. Eldridge Wheeler, in 1936.

The capacity of the institution, at the time of opening, was 25 adult patients. Through the efforts of the Kiwanis Clubs of Grays Harbor County, namely, Aberdeen, Elma, and Hoquiam a Children's Ward wing was added in 1924. A Women's Ward wing, to accommodate 26 patients, was added in 1926. In 1929, the employee's home was built.

At present, the bed capacity is 65, with accommodations for 25 men, 26 women and 14 children.

MOUNTAIN VIEW SANATORIUM

LAKEVIEW WASHINGTON

Ross E. McPhail, M.D.,
Medical Director

MOUNTAIN View Sanatorium is situated at Lakeview, Washington, nine miles from Tacoma, Washington, which is the County seat of Pierce County, Washington. The grounds contain forty acres of natural park consisting of Fir and Oak trees. From the porches and wards, there is an unsurpassed view of Mount Tacoma.

The corner-stone was laid May 16, 1914, and the first patients admitted January 12, 1915. The present capacity is 110 beds for Adults and a Preventorium of 30 beds. The Sanatorium is under the direct supervision of the Pierce County Commissioners. The institution is fully equipped for Medical and Surgical treatment.

Washington Sanatoria

BLUE MOUNTAIN SANATORIUM

WALLA WALLA, WASHINGTON

MARIAN GILLESPIE, R.N., Superintendent

THE Blue Mountain Sanatorium was built by PWA funds and the institution was officially opened on May 18th, 1935. The sanatorium has 32 beds and is owned and operated by the County of Walla Walla and it receives state aid.

It is situated on a bluff overlooking the Blue Mountains about two and one-half miles from the City of Walla Walla. The sanatorium has a cheerful environment and it commands a beautiful view of the surrounding valley. The flowers and well kept grounds have solicited much praise from patients and visitors to the sanatorium.

Dr. R. W. Smith is employed part time as medical director. Particular attention is given to the diets. The meals are carefully prepared and they are especially planned for each patient. Fresh vegetables and fruits are supplied in abundance.

VETERANS' ADMINISTRATION FACILITY

WALLA WALLA, WASHINGTON

ORVILLE D. WESCOTT, M.D., Manager

THE Veterans Administration Facility at Walla Walla, Washington, is situated to the southwest and adjoining the city limits. The reservation consists of approximately 600 acres of land, and prior to its release by the U. S. Army to the U. S. Public Health Service in 1921, it was for many years a Regimental Cavalry Post of the Army.

After remodeling and the construction of several additional wards this former army post was opened as a Tuberculosis Hospital. The gradual decline in the need for beds for tuberculous patients during the past several years, and the need for additional medical and surgical beds, changed the type to a general medical and surgical hospital, with 150 beds reserved for tuberculosis patients, and a total bed capacity of 400.

Three wards are reserved for the tuberculous group; classified according to the stage of the disease and the type of treatment required. A modern receiving ward and surgical service building was constructed in 1928; also, a new and up-to-date dietetic service with modern equipment; and a recreation building, which provided for library space; a large auditorium with stage for moving pictures and sound equipment; a billiard room, canteen, barber, and tailor shops. The illustration above shows the Administration Building, the ward buildings to the right, and at the far end of the old parade ground the new receiving ward and surgical service building, with officers' quarters to the left. The present patient population is approximately 400, with a monthly turn-over of the patient group of from 150 to 175.

Sinusitis With its Complications Simulating Tuberculosis

JOHN E. NELSON, M.D.*
Seattle, Washington

THE common association of sinusitis and bronchitis has been noted repeatedly in medical literature. But it is not so well known that symptoms arising from these conditions frequently simulate tuberculosis of the lungs. Many patients with sinusitis and its complicating lower respiratory infections are diagnosed and treated as tuberculous. This is due in part to the similarity of symptoms—cough, expectoration, pain in chest, malaise, loss of appetite and weight, fever, and even hemoptysis, and also because in both these conditions symptoms may persist for a long time.

Two French surgeons, Rest and Sergent, made the observation during the World War that soldiers treated for pulmonary tuberculosis were in a great many cases suffering not with tuberculosis, but with bronchitis associated with sinus disease, and when the sinusitis was cleared up the bronchial symptoms disappeared.

It may well be accepted that subacute and chronic bronchitis, pneumonitis, and bronchiectasis are due in most instances to sinusitis, and the clinical picture often presents a tuberculous appearance. In our own experience a number of cases have occurred which have aroused our interest in this matter. In one typical case the patient was tentatively diagnosed tuberculosis and referred to Laurel Beach Sanatorium. Examination failed to reveal tuberculosis but did bring out subacute bronchitis and sinusitis, the correction of which promptly led to recession of symptoms.

In the study of diseases of the respiratory tract, one must appreciate the fact that the upper and lower respiratory areas are but separate sections of one specific system, and that infection in one part usually involves the other. There is an intimate relationship between these two sections through the lymphatic system and through inhalation.

Mullen and Rycer, by extensive animal experimentation established the fact that infection from the paranasal sinuses readily extends downward toward the bottom of the respiratory tree.

By the use of carbon suspensions and tubercle bacilli emulsions these men proved that lymph drainage of the antrum is by the way of the submaxillary, and deep cervical nodes, then through lymph ducts and great veins to the right side of the heart, and, of course, to the lungs.

They also proved that inhalation leads to the same end. India ink and bacterial suspension injected into the nasal fossa, or into the antrum in such amounts that a good deal escaped into the nasal fossa, were readily inhaled, producing effects in the lungs. Microscopic sections of the lungs revealed carbon and bacilli packed in the alveoli both free and in large mononuclear or in alveolar cells. They then become detached, either to be cast off in the expectoration or taken up and carried along the course of lymphatic absorption.

These men were of the opinion that irrespective of whether the infection spread through the lymphatics or by inhalation, the bronchial and mediastinal glands become involved.

Thus there are two main routes which connect the sinuses with the lower respiratory tract—the lymphatics which can function even when the sinuses are not draining, and inhalation or direct continuity which is open to any infection reaching the nasal fossa from the sinuses or elsewhere.

The principle infections commonly accompanying sinusitis and which may simulate tuberculosis are laryngotracheitis, bronchitis, pneumonitis, and bronchiectasis. A careful examination of the entire respiratory apparatus in patients presenting suggestive symptoms should, in practically all cases, reveal a definite distinction between the tuberculous and the non-tuberculous lesions. It must be borne in mind, of course, a patient may be suffering from both sinusitis and tuberculosis.

In the differential diagnosis of respiratory conditions the physician will be much more

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accurate in his diagnosis if he has a definite plan to follow such as the four-step outline suggested by the National Tuberculosis Association.

1. *History*—A carefully taken history is of vital importance as it will frequently make the examiner suspicious of an upper respiratory infection being the primary source of trouble. Symptoms frequently seen are repeated headcolds, with stuffiness of the nose and post-nasal drainage. Pain is not always present. It depends upon whether there is an acute or chronic condition with or without obstruction to drainage. The location of pain will depend upon which sinuses are involved. If it is a maxillary, which is most frequently infected, there is often tenderness over the cheek bone and at times over the frontal region. In frontal sinusitis, the pain is usually supraorbital, with acute tenderness in this area. In ethmoidol and sphenoidal infection, the pain is often ocular with a generalized occipital headache. As complicating lower respiratory infection develops there is often pain or soreness in the parasternal regions. Any persistent cold should make the examiner consider a complicating sinusitis. However, a negative history of upper respiratory infection does not preclude the possibility of sinus disease. A chronic sinusitis may often be highly insidious. It may cause no pain. The discharge may be slight, there may be no cough, headache, fever, and yet the patient goes steadily down hill, due to the absorption of toxins from the extensive mucous lining of the para-nasal region. In tuberculosis, while there may be a history of frequent colds, they are not accompanied by localized sinus symptoms. And the pain in the chest is usually unilateral.

An acute sinusitis may result in only slight bronchial disturbance or pneumonitis but as the sinusitis becomes more chronic, purulent or hyperplastic, we frequently see chronic bronchitis becoming established and if the sinusitis is neglected it often results in a bronchiectasis. Therefore a history of upper respiratory infection or of bronchitis, pneumonitis, or bronchiectasis, should make one search for a primary cause, a probable sinusitis. While the history is of vital importance in suggesting the possibility of sinus disease further study is needed to arrive at an accurate diagnosis.

2. *Physical Exam*—Nose and throat: A careful nose and throat examination of every patient should be made where there is a possibility of a respiratory tract infection. If the pharynx reveals an inflammatory area along the posterior pillars or generalized inflammation, or if there are postnasal mucopurulent discharge, engorged turbinates or deformity with obstruction one should be very suspicious of sinusitis.

Transillumination is of vital importance as many suspicious cases can be found by this procedure. A sinus transilluminator should be as much a part of the physicians equipment as the stethoscope. One of the best lamps is the rehostat type with a small pencil shaped bulb which can be placed against the lower eyelid and pressed backward beyond the infra-orbital ridge. The light is directed downward toward the floor of the antrum and the illumination is viewed in the roof of the patient's mouth. The room must be dark and care used in not having the light too bright or very slight cloudiness of an antrum will not be noticed. This method of transillumination of the maxillary sinuses gives better results than the older method of placing the globe inside the mouth and looking for cloudiness on the skin surface.

The finding of changes in a sinus may represent past rather than present disease. On the other hand there may be definite sinus disease without noticeable change on transillumination. While the general practitioner may not be able to diagnose most of his cases of sinusitis, he should be able to screen out the suspicious ones and refer them to the rhinologist for more complete study.

Bronchitis, pneumonitis, and bronchiectasis, the frequent complications of sinusitis, are usually confined to the hilar and basal regions of the lungs and are mostly bilateral. Rales and rhonchi are found mainly in these areas. In tuberculosis the lesion is found in the upper part of the lung in 95 per cent of cases and is usually, until more advanced, unilateral.

3. *Laboratory Work*—There are two tests of great value in helping to rule out tuberculosis. The Mantoux or tuberculin skin test and the sputum examination. A negative Mantoux up to a 1 mg. O.T. is proof of a non-tuberculous lesion. A positive tuberculin reaction means that the individual has been in-

fected by tubercle bacilli but does not mean he is suffering with tuberculosis. Repeated negative sputum tests for tubercle bacilli in a patient who has coughed and raised sputum for weeks is very strong evidence against tuberculosis. The sedimentation rate will usually be found more rapid in an acute sinusitis than in a minimal tuberculosis.

4. *X-ray Study*—Sinus films are of great aid in many cases but information derived from them must frequently be correlated with all the data before a definite diagnosis can be made.

Shambough (Practical Medical Series Nose and Throat) states, "In the case of the maxillary sinus, which is by far the most frequently involved, very little is added by the x-ray that is not shown by transillumination. And irrigation of the sinuses, so simple for the rhinologist to carry out, gives more information than either."

In bronchitis the x-ray film of the chest frequently reveals increased hilar shadows with generalized increase in peribronchial markings extending out from each hilum, more pronounced in the bases, with no parenchymatous involvement. Pneumonitis, or bronchopneumonia, is characterized by peribronchial infiltrations clustering about branches of the middle and especially the lower lobe bronchi. These infiltrations are multiple foci of infection resulting from organisms penetrating the bronchial wall. These areas of pneumonitis may remain small and soft in appearance, showing feathery edges, or they may coalesce to form irregular areas of consolidation. Disease may be more pronounced on one side than the other, but there is always some degree of bilateral involvement.

In tuberculosis, considerable variation in shadows is seen. However, one may accept it as a rule that infiltrations in the apical and infraclavicular regions are tuberculous, especially if they are small, nodular and occur in groups. Minimal tuberculosis is usually unilateral. If the lymph glands are enlarged it is on the side of the mottling and usually there is some fibrosis between the distal focus and enlarged glands. One of the greatest aids to differential diagnosis is the fact that shadows produced by bronchitis and pneumonitis are more transient and variable than those produced by tuberculosis. Those of tuberculosis are more constant. Serial films to detect these changes are of greatest importance.

No doubt many cases of sinusitis with its complications may be correctly diagnosed by the use of only one or two parts of the presented outline. However, one encounters difficult cases that require not only the entire examination but prolonged study and observation before it is possible to determine whether one is dealing with a sinusitis and its complications or with tuberculosis.

Summary

1. Sinusitis together with its complicating infection of the lower respiratory tract frequently simulates tuberculosis of the lungs.

2. The upper and lower respiratory tracts are simply separate parts closely united by lymphatic system and by inhalation into one specific organ.

3. The paranasal sinuses in their strategic position at the head of this respiratory mechanism are the key to the transmission of many of the non-tuberculous infectious diseases to which the respiratory system is subject.

4. In the diagnosis of diseases of the respiratory tract there should be close cooperation between the physician in charge of the case and the nose and throat specialist.

5. As an aid in the differential diagnosis of respiratory disturbances a definite outline of procedure is advisable, such as History, Physical Examination, Laboratory Work, and X-ray Study. Such a plan leads to far more satisfactory results.

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The Determination of Activity of Small Tuberculous Pulmonary Lesions

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MODERN methods of tuberculosis case finding involve the routine roentgenological examination of large groups of the population. The percentage of active cases so found varies with the type of group studied from 0.1 per cent in young children to 9.0 per cent in adult contacts[1]. The medical literature of the last seven years indicates that the method can be very effective and that it will likely be used more widely. It is especially valuable in bringing to light many small lesions.

Such campaigns are valuable only insofar as the activity of each newly found lesion is accurately determined and the patient properly managed from then on. Here the general practitioner plays an important role. In some places, notably Detroit[2] he takes a part in the case finding itself, but everywhere he is called upon to advise and care for patients so found. The apparently normal individual who, by the mere accident of being included in a group examination, is informed that he has tuberculosis will naturally go at once to his family physician for an interpretation of the findings.

It is obvious, therefore, that the general practitioner must understand the potentialities of these unsuspected lesions in order to give wise counsel.

The majority of the cases so found are in a minimal stage[3, 4], and a high percentage are asymptomatic. Further study shows many of these to be active, nevertheless. This is in marked contrast to the condition in most sanatoria where only a small percentage of patients are in the minimal stage and a much larger percentage advanced. Those with minimal lesions usually manifest few or no symptoms and were probably diagnosed following some routine examination. Of the advanced cases, nearly all have symptoms; indeed it was the awareness of symptoms which led these people to consult a doctor.

It must be emphasized that not all cases of tuberculosis found in roentgenological surveys are in a minimal stage. Some are advanced and even associated with severe symptoms for which the patient had not sought relief. Other advanced cases, however, produce no symptoms or not enough to suggest to the individual that he should seek medical advice.

When confronted with roentgenological evidence of a pulmonary tuberculous lesion, the immediate problem is to determine whether or not it is active. When symptoms are present, there is no doubt; but when even the most searching history fails to elicit symptoms, it is often very difficult.

The acceptance of the fact that active tuberculosis may be present without symptoms is fortunately increasing. Too frequently, however, physicians are lulled into a false sense of security by the apparent good health of an individual. Most of us were taught that active tuberculosis was always accompanied by certain symptoms; when these were not present, neither was active tuberculosis. Maurice Fishberg, in the fourth edition of his book "Pulmonary Tuberculosis" (p. 229), says, "there is no active phthisis without constitutional symptoms." He stressed the point by repetition within the chapter. In spite of his emphasis on the statement there is sufficient evidence available now to render his statements definitely misguiding.

It is possible that if our methods were sufficiently refined we could detect constitutional reactions associated with activity of any pulmonary lesion. But if we were to depend only upon the presence of the constitutional symptoms enumerated by Fishberg before diagnosing activity we would frequently permit our patient's tuberculosis to spread undetected. We are beginning to realize now that the symptoms and signs, "fever, cough, tachycardia, languor, nightsweats, hemoptysis, etc." (Fishberg, p. 225) are often relatively crude tests of bodily dysfunction. If these symptoms are marked the disease is almost always beyond the minimal stage. Patients often allow these symptoms to persist for long periods before seeking medical advice.

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From a practical standpoint, therefore, these symptoms are useless for early diagnosis of the disease and their absence does not indicate absence of activity.

A careful recording of the temperature over a variable observation period should be made. If fever is demonstrated it has significance, but if no abnormal reaction is found, one is still not justified in making a diagnosis of no activity.

The known sensitive indicators of tissue change such as serial differential white blood counts of the Schilling and Arneth varieties, and the blood sedimentation rate determinations will often give evidences of activity without any kind of subjective manifestations or abnormal temperature reaction. Bredeck[5] has used careful Schilling blood differential counts before and after injections of tuberculin and believes that by this means he can differentiate active from inactive lesions. This method deserves further use.

In early tuberculosis physical examination often reveals no abnormality. This fact has been well established[6, 7]. If the moist, bubbling, fine, or medium type of rale is present an active lesion may usually be inferred. Certain other types of rales, notably the so-called dry or crackling variety may be present for years over the site of inactive lesions. The absence of abnormal physical signs has no value at all in ruling out either the presence of activity or a lesion itself.

When sputum is produced as a consequence of a tuberculous lesion the disease has often progressed beyond the minimal stage and excavation has occurred. Furthermore, as Pinner and Werner[8] have shown such sputum will nearly always be found positive for acid fast bacilli if examinations are made properly. A positive sputum means activity, at least in the sense that the patient requires further observation and treatment. All too frequently sputum examination is neglected although it is one of the simplest laboratory procedures. On the other hand, to wait for a positive sputum before diagnosing either the presence of tuberculosis or activity is to wait for a lesion to progress beyond the early stage.

The roentgenographic method is not only a highly accurate means of finding tuberculosis, but when properly used is also a sensitive indicator of activity. In many instances it is possible to make a definite diagnosis of activity on the appearance of the initial film. Irregular, cotton-like, blotchy shadows, frequently characterized as "soft" are good evidences of an active lesion. In the author's experience, it is justifiable to recommend bed rest for such patients even though there is no other evidence of activity.

In other instances, where the initial film is not so definitely indicative of the state of activity, further observation is required. Serial roentgenograms may reveal a change in the size or density of the lesion which is evidence of activity. A spreading lesion requires prompt treatment; bed rest, and probably some type of collapse therapy, regardless of how well the patient may feel. Films made at intervals of a month or two may reveal an increase in the size of the involved area, even to the production of a cavity, without at any time showing any constitutional reaction.

In some individuals, especially older adults —graduate students most often in the author's experience, the history will reveal a past record of tuberculosis during which roentgenograms were made. Whenever possible these should be consulted in order to get an idea of the original appearance of the lesion and especially to compare with the most recent film. Any change during the interval is significant.

A retrogressing lesion is evidence of a labile tuberculous process. It is a matter of experience that it is not infrequently accompanied by a spread in another area of the lung. Curiously, the diminishing lesion itself sometimes reverses its process and suddenly spreads. Although retrogression will not be accompanied by an abnormal temperature curve, sedimentation rate or blood picture, the patient must have the same observation and contol as a patient with a spreading lesion or symptoms. Some of these points are illustrated by figures 1 and 2.

The fact that in most instances active tuberculosis or a rapidly spreading lesion is accompanied by systemic reactions does not invalidate what has been said above. It is well known also that constitutional symptoms such as fever may be present for long periods as evidence of activity without being accompanied by x-ray changes. It behooves the

physician to remember that very often these lesions have a long period of latency. After months or even years they may begin to spread or show changes although in the meantime there had been no constitutional reactions or x-ray changes.

As McPhedran[9] pointed out, in actual practice the only type of tuberculous lesion which may be considered healed is the sharp dense strands which remain stable for years under competent roentgenographic control. Any other patient should be kept under observation with frequent roentgenograms for many years. Above all, he should not de dismissed from all observation because he appears perfectly healthy at the time. One must remember that if he should return with symptoms at a later date, the disease will very likely be in an advanced stage.

It should be pointed out that in order to detect the minute changes which are so important in this work the best possible roentgenographic technique is essential. The films must be read by a trained observer. Furthermore, since periodic observation over a period of years is necessary arrangements should be made for storing films for reference purposes as long as the patient lives. All too often one finds that a definite determination of a patient's tuberculosis is prevented or at least long delayed because earlier x-rays of his chest have been destroyed. On the other hand what a satisfaction it is to compare recent films of a patient with those made months or years previously, and to find no change.

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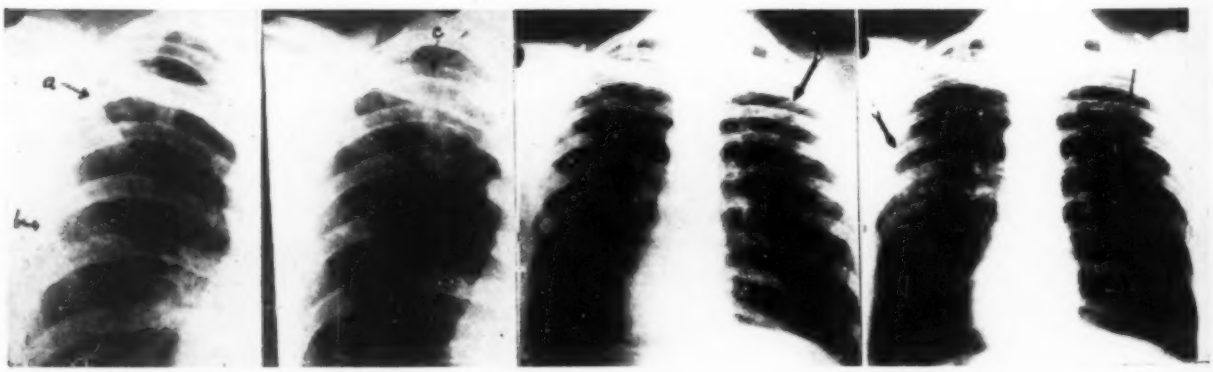

A. 11-17-32 (Fig. 1) B. 5-3-33

Legend

Fig. 1. K. S.; medical student, age 21 years, A. 11-17-32, found by routine roentgenography. No symptoms. Shows soft lesion in periphery of left first anterior interspace (a) and scattered soft mottling in mid-lung area (b). On 5-3-33 (B) the shadows noted at (a) and (b) have largely disappeared but a new "soft" lesion containing a cavity has appeared at (c). At this stage and during the intervening period there were no symptoms although he carried on his school work but with some limitation of activities. Shortly afterwards he went to a sanatorium; positive sputum developed later; but he was discharged in 1936 with a few hard string-like shadows as only residuals of previous lesions.

A. 1-11-33 (Fig. 2) B. 10-31-33

Legend

Fig. 2. L. W., male laboratory technician, age 23. A. 1-11-33, found on routine roentgenography of employees, shows small lesion, not definitely active—appearing, in right 2nd anterior interspace. Symptoms were not present but patient urged to have frequent examinations. Next seen 10-31-33 (B), this time with symptoms and new, diffuse, wide area of infiltration in the opposite axilla. But now first lesion (small arrow) is much smaller and more string-like.